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April
1926

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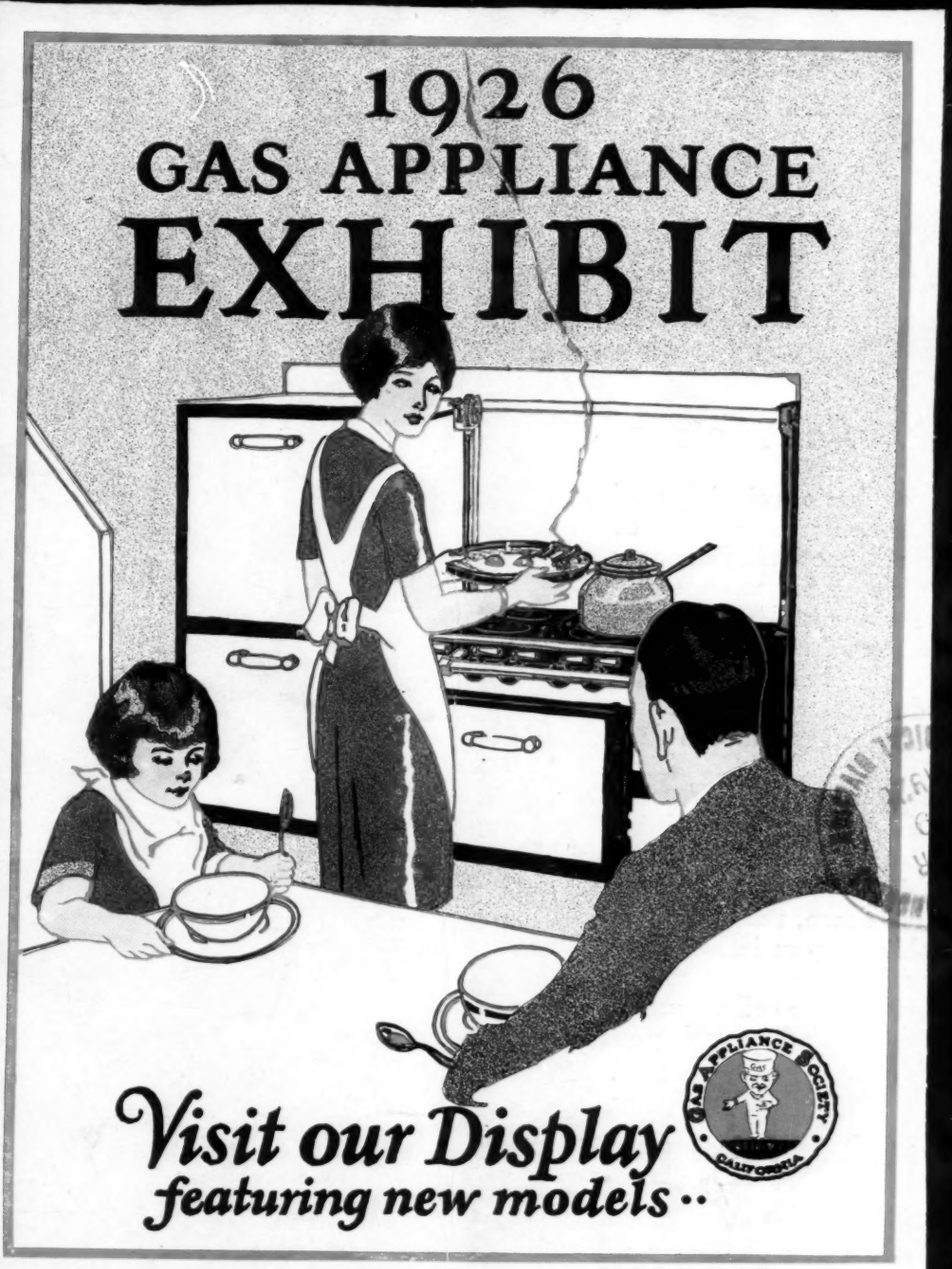

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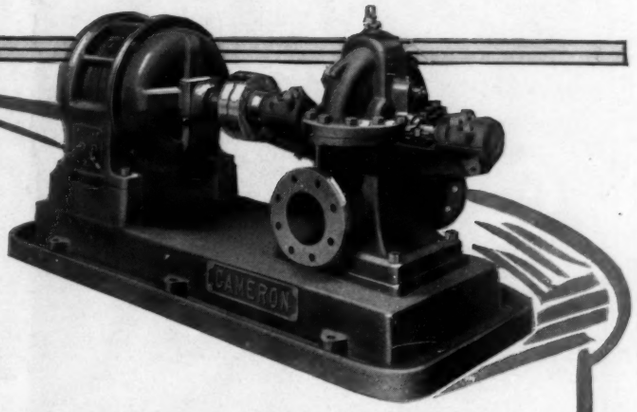

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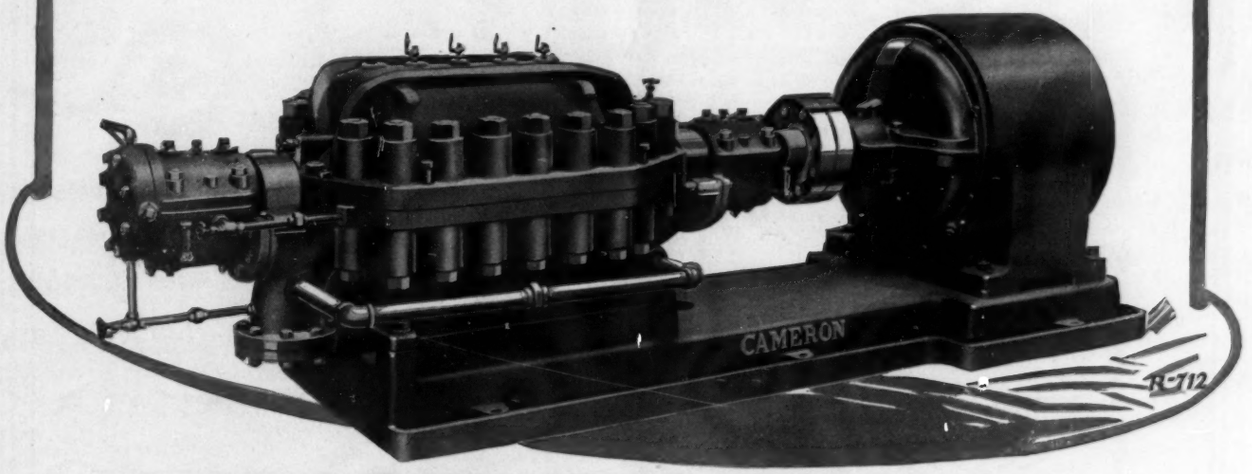

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Official Publication Of The
Pacific Coast Gas Association

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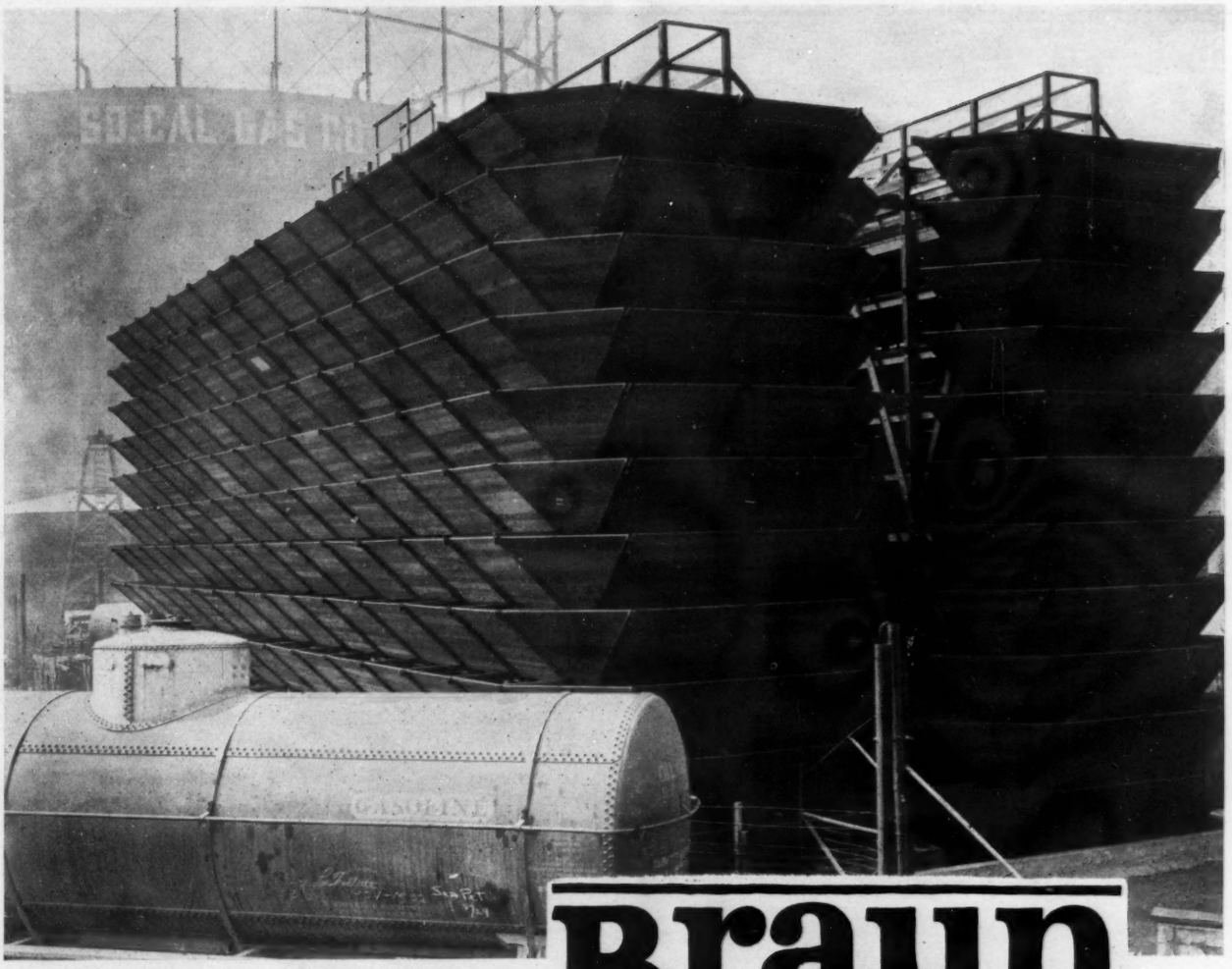

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Bulletin 114 covers thoroughly the subject of cooling towers. It will be sent upon request.

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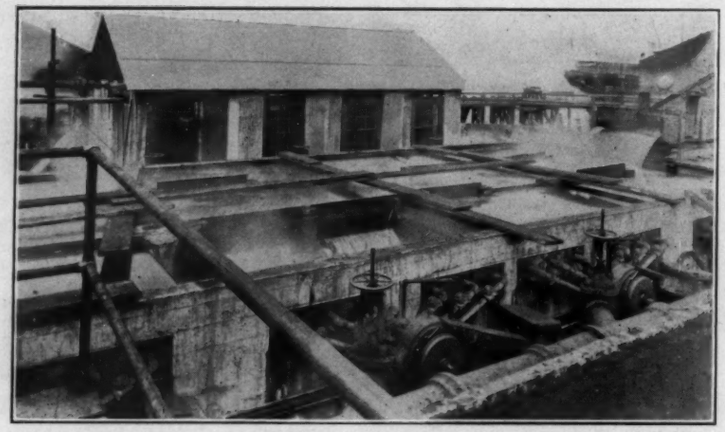

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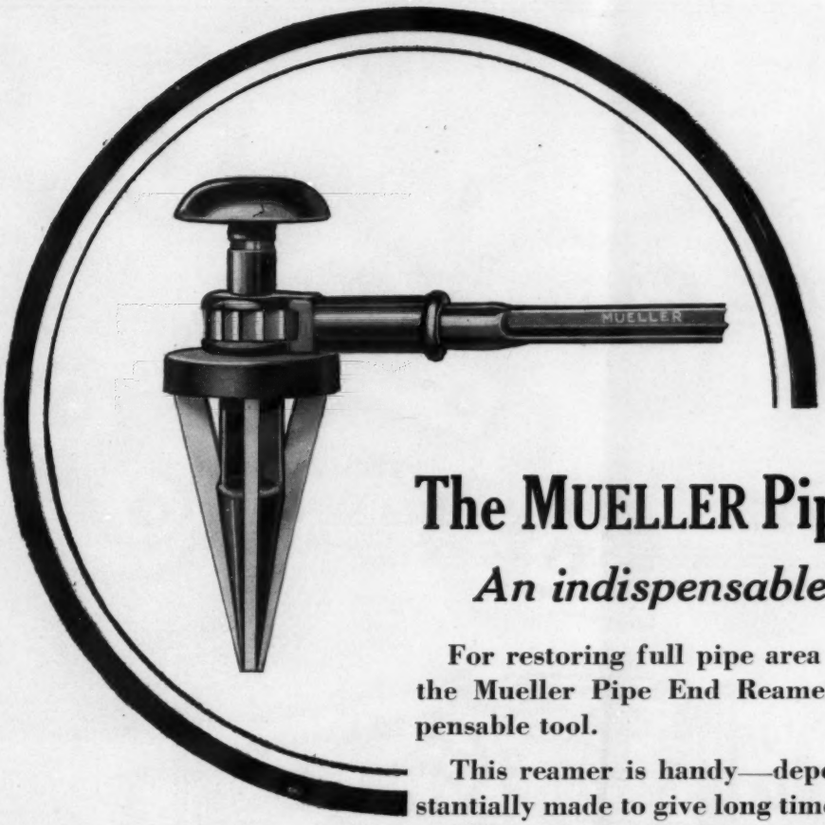

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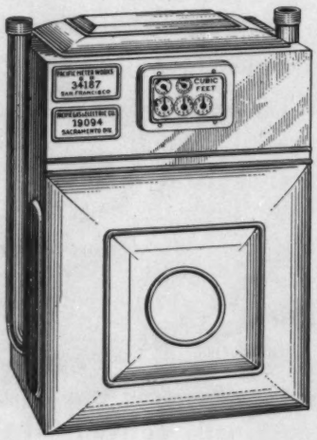

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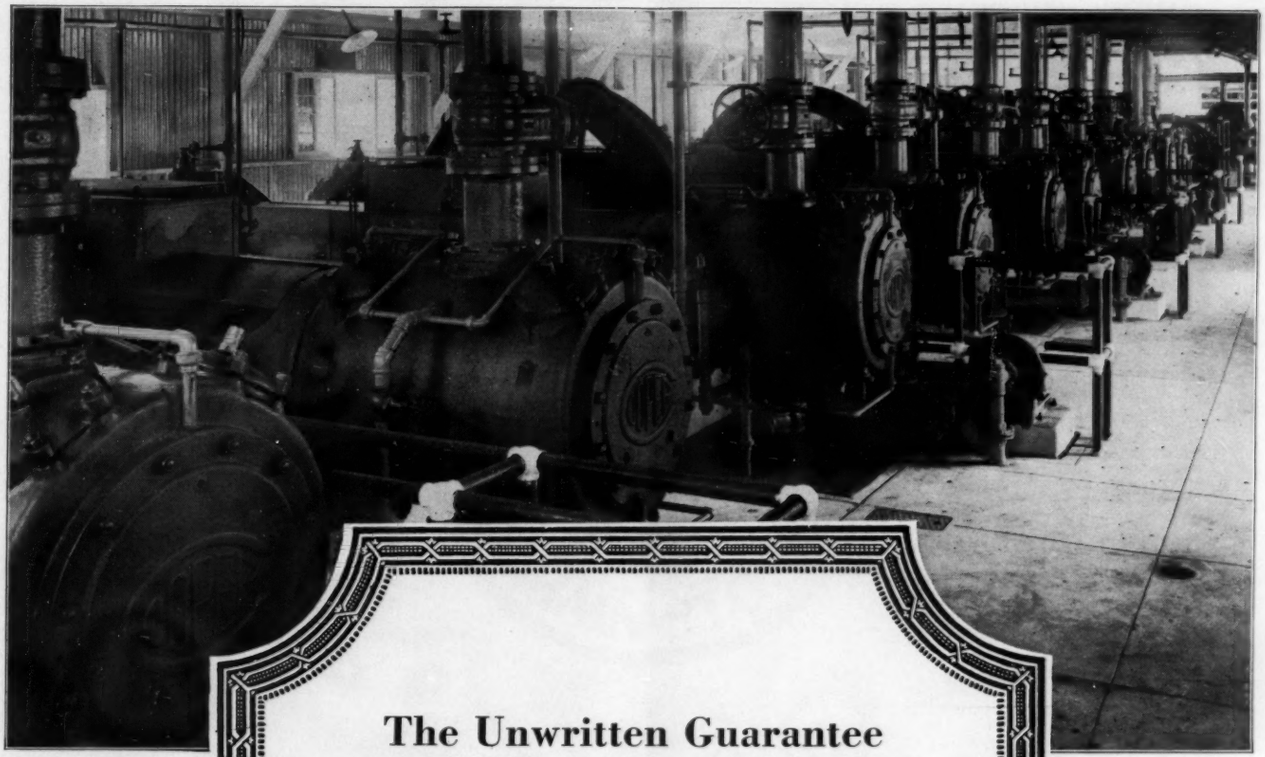

The above photograph shows Pacific Gasoline Company's Inglewood, California, Gasoline plant which contains 5 Cooper Type-75 gas engines.

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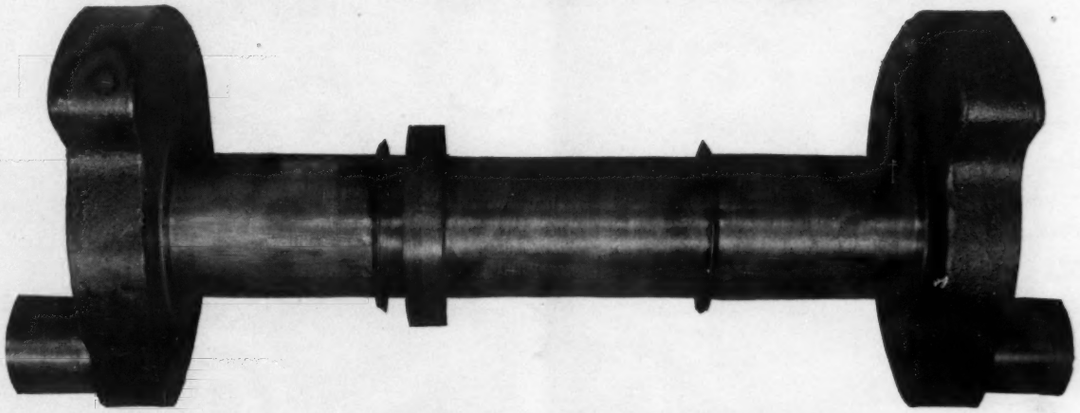

Crankshaft of 175 H. P. CLARK—12 inches diameter

Importance of the Safety Factor

In the good old days when gas was plentiful and royalties were low, Natural Gasoline Producers were not so concerned over a few days shut-down and the replacement of engine parts, but now "things" are different. Purchasers are no longer satisfied to have the broken parts replaced free "f.o.b.," or possibly a 50-50 adjustment. They aren't thinking about the cost of that part but—"how much did that shut-down cost me"?

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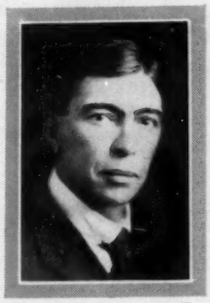
WESTERN GAS

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in the *Eleven Western States*

Our Gas Appliance Situation---*Is* It *an* Asset *or a* Liability?

By E. L. HALL

General Superintendent, Portland Gas and Coke Company
Portland, Oregon



E. L. Hall

IN THE SATISFACTORY utilization of gas lies the industry's hope for progress, says the author of the accompanying article. Mr. Hall, chairman of the Appliance Certification Committee of the Pacific Coast Gas Association, has views on the appliance situation that are shared by a great many leaders of the industry on the Coast, and his article should command an attentive reading. There will be differing opinions on some of the contents of the article, and WESTERN GAS will be glad to give space in future issues to any of our readers who desire to comment on any phase of this important question. The industry will benefit from a full discussion of the situation.

THE importance of the appliance situation is becoming from day to day more evident as the most vital single factor in the growth and prosperity of the gas industry.

As we glance back over the development of our industry through the decades, it is apparent that various phases of the business have in turn occupied a dominating position in the minds of the leaders of the industry—possibly to the exclusion of other equally important phases.

In the earliest days when the manufacture of the product was the one essential consideration, the leaders of the industry were engineers and mechanics. It was said in those times that the profits were made and lost in the retort house.

As time went on and manufacturing methods were developed, then standardized, the industry turned its eye toward greater expansion, and the era of promotion began. The necessity for intensive new business activities was the more necessary because of the advent of electrical competition.

As the combined effects of improved manufacturing methods and aggressive new business tactics resulted in gas becoming a universally used commodity and hence a necessity in the home, the matter of rates became a serious aspect of the industry. This was the era of regulation by commissions, appraisals of property and long-drawn out legal controversies.

The next stage in our development, possibly a logical outcome of the preceding one, was the realization on the part of broad-minded leaders that security of investment and successful promotion could not be attained save on a foundation of public good will, and hence the present era in which public relations holds the center of the stage.

Utilization Is Next

It is the purpose of this article to forecast what the next stage in the development of our industry will be. The prediction is made that the utilization of gas economically, safely and conveniently will and should receive from now on the greatest attention.

There is no question but that today relations with our customers and with the general public in one form or another practically engross the attention of the executives of our larger public utilities. Every effort is made to promote cordial relations with our customers, with the business men of the community, with the politicians and the legislators.

Every policy, every act, is scrutinized from a public relations viewpoint. Volumes have been written on the subject, designed to foster on the part of the employees in the industry a proper attitude for the promotion of good public relations. Other departments in the industry may suffer, but no sacrifice is too great if only it be made in the name of public relations.

However worthy the efforts have been, and notwithstanding a great measure of success, it cannot be denied that all of these efforts have been much handicapped by a disregard of fundamentals, rearing, as it were, a structure on a foundation of sand. Good relations cannot be successfully promoted and achieved except upon a foundation of not merely good service but satisfied users of our commodity. Now, I can hear the roar of protest going up against this remark. "Sure, we believe in good service." Well, let's analyze the situation a bit. Perhaps a little parable will help in getting a new slant on this situation.

A Parable on Public Relations

Once upon a time, there was a farmer called Mr. B. Gas (Yes, you have

guessed it, the "B" stands for "BAD"). This fellow had a most charming and pleasant wife, a credit to the whole family; a very cultured woman and of a most charming personality, but as frequently happens, a very poor housekeeper. Let us introduce Mrs. Public Relations Gas. Now, Mrs. B. Gas, although a good farmer, had not achieved prosperity by a process of scientific farming but had inherited numerous rich acres from the efforts of his pioneer father, who had cleared away the forest and brush and his son had become rich through the settling up of the region and the increased price of land. As sometimes happens with the newly-rich, Mrs. Public Relations Gas was bitten with the idea of getting into good society. Being a mixer and having a good gift of gab, she was soon a prominent member of all clubs. Before long, her social campaign made it necessary to entertain in her home. The best people in the community were asked with their families to an elaborate party. Assisting their mother in receiving the guests were the charming daughter, Miss Pretty Gas Stove and the young heir to the family fortune, Mr. Hot Heater, while in the background, nervous and tittering, stood Father Gas.

The Party Flops

THE neighbors came to this party all right, but for some mysterious reason there was an air of constraint. Real cordiality and appreciation for the entertainment was lacking. Poor Mrs. Public Relations was distracted. She redoubled her efforts at lively chatter but all to no purpose. In vain did she stimulate the efforts of her daughter. Miss Pretty Gas Stove, to entertain the guests and urge her son, Mr. Hot Heater, to jolly along the male guests. Even poor Mr. Gas made an effort to be witty and agreeable. The party broke up early and the affair was a frost. Much humiliated and in tears, poor Mrs. P. sought the counsel and sympathy of her bosom friends, Mrs. Association.

"My dear," said she, "What do you suppose could have been the matter? We have such a wonderful home, you know, and the decorations were superb, and as for good things to eat—why, the table fairly groaned. What do you expect could have been the matter!"

Well, you know how bosom friends are. Mrs. Association lost no time in telling her the facts. "Why, dearie, somebody ought to tell you and I am sure you will pardon the frankness of an old friends like myself. The trouble, my dear, is with your family."

"My family!" exclaimed Mrs. Public Relations. "What do you mean? My husband is the kindest man and my children are most devoted to me."

"That is not what I mean," said her friend. "Possibly you are used to their shortcomings and don't appreciate the effect they produce upon strangers."

"Do go ahead and tell me what is wrong with them. Don't hesitate, I beg of you."

"Well, since I must tell you, here are some of the things that I noticed personally. Your dear husband, while a most estimable man in every way is, after all, a farmer. While I am sure that he made an effort to tidy-up before he came to your party, it cannot be denied that he was accompanied by a strong odor of barnyard manure. Surely a good perfumed bath would have helped matters. As for your daughter, she is undoubtedly a charming girl but unfortunately she is one of those individuals who are afflicted with halitosis. That explains why the young men didn't care to dance with her."

"Yes, but dear Mrs. Association, surely there could have been nothing wrong with my big, stalwart, son, Hot Heater!"

"Well," was the rejoinder, "let me tell you what my husband told me. It seems that your son has a very bad temper and is given to dangerous and explosive fits of violence. People are really afraid of him, my dear."

Thus it was that Mrs. Public Relations Gas learned the futility of her social campaign by reason of the shortcomings of her family.

To those who know the situation, the efforts of our public relations men are not dissimilar to the efforts of the lady in the parable. The crying need in our industry today is for installations that will not handicap the sterling worth of our commodity. How shall we go about this?

First Place to Utilization

FIRST and foremost in the writer's estimation must come in the minds of the leaders of our industry a realization of the situation—leading to their unqualified support for such measures as will be effective. There must come into the minds of those who are giving the matter of public relations their undivided attention, the realization that they must give equal consideration, if not more, to insure that their customers experience satisfaction in their usage of gas. There must be a willingness to spend money—to make sacrifices—to bring about an improvement in this situation. At the present time there is too much evidence of an attempt to handle the appliance situation with gloves, or worse yet, not to handle it at all and leave it to others. To be sure, there are executives who will tell you that they are not in the appliance business and don't want to be. It is the writer's firm conviction that the appliance problem is so important and at the present time so acute that it would be suicide to leave this problem to be solved by others.

Coast Must Support A. G. A.

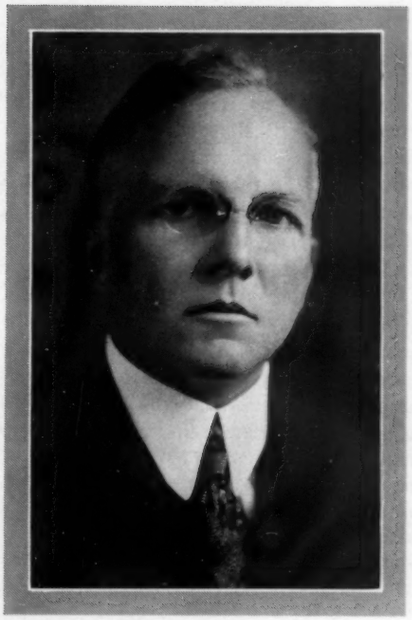
OTHERS will tell you very glibly what the American Gas Association is going to do, etc., but they forget that the American Gas Association is not supported by contributions from the United States Government and that the funds and personnel necessary to carry on these activities must be secured from the resources of the gas companies, comprising the bulk of the industry. It is also fairly obvious that utilization engineers are not developed in college laboratories but acquire their experience in practical service to the public. How may the engineers of the public utilities acquire such experience when the utility is not in the appliance business? It follows of necessity that to gain the proper knowledge of the situation and to train men capable of coping with it that a most intimate association with the actual consumers of gas must be had by the utility. The only contact some gas companies have with their customers is through the collection department. Every utility that desires to do its share in promoting the gas industry should not alone maintain a service department but should be a leader in its local community in the merchandising of gas appliances, not merely for the reasons above stated but also to raise the standard and set the pace for good appliances. It is almost essential in this connection that the utilities that can afford to do so should maintain a well-equipped utilization laboratory. The one outstanding factor in the success of the electrical industry has been the research laboratories for the development and testing of electrical apparatus maintained by such wonderful and elaborate institutions as the General Electric and Westinghouse Companies. The utilities might be pardoned for a failure to sponsor a development of gas appliances by contributions of money and time were the gas industry similarly equipped with such agencies as the electrical industry. Under the circumstances however, there is no excuse for failure to support the activities of the American Gas Association on the part of every utility, even those on the Pacific Coast, in its effort to carry on an appliance testing laboratory and in its recent appropriation of a fund for development of gas appliances.

In addition to the shortcomings of the appliances themselves, there are other

(Continued on Page 39)

When Does Legal Liability Arise *in* Gas Appliance Installation?

By PAUL OVERTON
General Counsel, Los Angeles Gas and Electric Corporation



Paul Overton

A DEALER is not an insurer of the safety of those using appliances which he installs. There is, however, a duty upon him to use ordinary care in making such installations, and his failure to observe that degree of care renders him liable for all damages resulting proximately therefrom unless, as later explained, he can establish the fact that the party suffering the damage was himself guilty of negligence which contributed proximately to the damage. For a better understanding of this liability, a brief statement of the principles of negligence and proximate cause is necessary.

History of Legal Rule of Negligence

In the beginning of our system of law, negligence as we now understand it was unknown. There was, however, an early form of action known as "trespass," by which recovery of damages could be had against a defendant who set in motion a force which, before it came to rest, injured the plaintiff or his property. This was an absolute liability for the immediate consequences of the direct application of force, and was without regard to the lawfulness of the act, the degree of care used by the defendant, or the fact that it was an unavaidable accident. Gradually the degree of care used by the defendant in setting the force in motion became important, and it became, and now is, the settled law that a defendant is liable for the immediate consequence of his act only if he had a wrongful intent, or if he was at fault. For the purpose of this inquiry we are not concerned with cases of wrongful intent, but only with cases where the defendant was at fault in the performance of a lawful act, and therefore liable only if negligent.

What the Complaining Party Must Prove

To make out a *prima facie* cause of action in a complaint for damages based on negligence of the defendant, the complaining party must produce evidence sufficient to permit the following questions to be answered in the affirmative: (1) Was the defendant negligent? (2) Did the plaintiff suffer damage for which the law will give redress? (3) Was the defendant's negligence the legal or proximate cause of plaintiff's injury?

A Legal Definition of Negligence

In determining whether the defendant is legally liable, the first question is: "Was the defendant negligent?" What then is negligence? Negligence may be said to be the omission to do something which a reasonable man, guided by those considerations which ordinarily regulate the conduct of human affairs, would do, or doing something which a prudent and reasonable man would not do.[1] It does not signify an absolute quality or thing to be measured according to a precise standard, but a thing which is always relative to particular circumstances. "The question whether or not upon a given occasion the conduct of a person is negligent, is always comparative and relative. The conduct must be compared to that of an assumed person of ordinary prudence, and must be considered in relation to all of the circumstances attending the occasion, which might reasonably be taken into consideration by a person of ordinary prudence in determining what his conduct should be. The circumstances to be considered are those which the evidence shows may reasonably be supposed to have been known to such person and to have influenced his mind and actions at the time. These are not necessarily the circumstances which afterward, in the light of events, it can be seen should have been known to him and should have influenced his conduct, nor is his wisdom in determining what to do to be judged by the event."[2]

Time, Place, Circumstance, Determine Negligence

Negligence, then, is the failure to exercise the care which an ordinarily prudent man would have exercised at the time and under the circumstances in question. It must be constantly borne in mind, however, that it is impossible to lay down an absolute rule or standard of conduct which will meet the test of ordinary care in all cases, for the simple reason that negligence is always comparative and relative to time, place and circumstance. Conduct, which a short time ago under particular circumstances would have been regarded as the exercise of ordinary care, might today under like circumstances be regarded as negligent. So, likewise, by reason of the constant change in the state of the art, materials or appliances or methods of construction approved and in general use a few years ago might today be regarded as unsafe. For example: the comparatively recent practice of wiring residences for electric lighting by means of insulated but exposed wire fastened at intervals to porcelain knobs attached to joists or studding would today be regarded as negligent construction in light of the present standard that such wiring should be carried in metal conduit.

Liability Resulting from Defective Appliance

Where damage results from a defect in the construction of an appliance and not by reason of any negligence in its installation, the question of the liability of the dealer depends upon whether he had knowledge of such defect. The rule is stated thus: "It is well settled that a man who delivers an article, which he knows to be dangerous or noxious, to another person, without notice of its nature and qualities, is liable for any injury which may be reasonably contemplated as likely to result, and which does in fact result therefrom, to that person or any other who is not himself in fault."[3]

[1] 82 U. S. 524 [2] 152 Cal. 604 [3] 104 Mass. 64.

It becomes very important, then, in determining what is ordinary care, to observe closely the development in the particular art or industry, and to follow the practice of those recognized as best informed in that art. This, of course, does not mean that one is an insurer, or that extraordinary means are to be employed to prevent harm to others while in the performance of a lawful act. The law does not impose any such burden. For example: it is not the practice to insulate high voltage electric transmission lines. The fact that such lines might be sufficiently insulated by the use of varnished cambric to prevent short-circuiting does not establish a standard of due care in the transmission of electric energy, for the reason that men of ordinary prudence engaged in this industry do not employ such extraordinary means to prevent the current from leaving such wires. However, gas appliance dealers would do well to keep abreast of the times and use only those materials and methods approved and recognized as safe by their industry. The technical committees of the Pacific Coast Gas Association have done excellent work in testing and approving materials and appliances and in establishing safe standards, and the observance of suggestions emanating from this Association along such lines would no doubt in most cases be regarded as meeting the legal requirement of the exercise of ordinary care.

Breach of Statutory Law Is Negligence

In determining negligence, it should be noted that the courts have quite generally held as *prima facie* evidence of negligence the failure to comply with statutory laws or municipal ordinances designed to protect persons or property. Such imputation of negligence, however, may be refuted by showing that the failure to comply with the law had no causal connection with the alleged damage. This question will be treated further under the topic of proximate cause.

The answer to the second question, "Did the plaintiff suffer damage for which the law will give redress?", will be assumed to be in the affirmative, because of course this is merely a question of fact, or a mixed question of law and fact, to be determined in each case by the court or jury.

The third question, "Was the defendant's negligence the legal or proximate cause of plaintiff's injury,", is one of the most difficult problems of this branch of the law. Different rules have been applied at different times, and different rules are today found in use by the courts of our several states. The rule laid down by the courts in California, and the one perhaps most generally applied, is that a party is liable for the natural and proximate consequences of his negligent act. Proximate results are said to be those which follow in natural unbroken sequence from the negligence of the defendant without the intervention of a more predominating or more efficient cause, whether such results could have been foreseen or not. This may be called the "hindsight test," because it views the result after it has occurred and inquires whether a responsible human agency has intervened between the fact accomplished and its alleged cause. If so, then the negligent act of the defendant is too remote, and no recovery can be had.

Liability Arising from Breach of Statutory Law

In discussing the determination of negligence, reference was made to the fact that the violation of statutory law is quite generally held to be negligence *per se,* but, as was there said, the injury complained of must be the natural and proximate result of such violation. To illustrate: The plaintiff is injured by falling into an excavation in a public street made without first obtaining a permit as required by municipal ordinance. There being no causal connection between defendant's failure to obtain a permit and the injury suffered by the plaintiff, no recovery can be had unless the defendant is guilty of negligence in making the excavation or in protecting the public from the peril thereof. But, on the other hand, if without fault himself the plaintiff is injured by falling into an excavation left unprotected, as required by ordinance, the defendant would be conclusively held to be liable for such injury, since the plaintiff's falling into the excavation is the natural and proximate consequence of defendant's failure to comply with the ordinance in this respect. Such requirements of the ordinance become the standard of due care.

Following are the causes which are most frequently set up as intervening in a manner sufficient to relieve the defendant from liability for his original act of negligence: acts or forces of nature, acts of animals, acts of plaintiff, and acts of third persons.

Causes Intervening to Relieve Defendant

It is universally held that the ordinary forces of nature intervening between defendant's negligence and plaintiff's injury are not sufficient to break the causal connection, because not only are the actions of such forces foreseeable by the ordinarily prudent man, but also because they are not a more efficient cause than the act of defendant in producing the injury. Of course, if such force of nature is unprecedented, abnormal and extraordinary in its operation, defendant is not liable.

In the case of intervention through the acts of animals, defendant will not be relieved unless it is clearly shown that the act in question is not ordinarily to be expected from such an animal.

When Plaintiff's Acts Remove Liability

Plaintiff's intervening acts are of two kinds: (1) those where he acts instinctively to protect himself from injury after having been placed in a position of peril by the act of the defendant, and (2) those where he acts deliberately in the attempt to extricate himself from peril. In the first class of cases the defendant is liable because it is natural that plaintiff should act instinctively to save himself. In the second class of cases the defendant is liable only in the event that the plaintiff, in the effort to extricate himself, has acted in the

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An Offer to Appliance Men

MR. OVERTON, author of the accompanying article, has made an offer relative to this subject of dealer liability which many appliance men will doubtless be glad to avail themselves of. The subject of liability and the law and interpretation of negligence, are highly technical legal questions, and any written treatment such as the present article must necessarily partake somewhat of the technical—though Mr. Overton's discussion is written in terms that most laymen will find easily within comprehension. It may well be, however, that questions related to the field of negligence will arise in the minds of those who read this feature. Such inquiries may be addressed to Mr. Overton, care of the Los Angeles Gas and Electric Corporation, and he will reply to them direct.

Everyone connected with the gas appliance field, and many in other phases of the gas industry, can profit by a careful reading of this feature on legal liability. Its implications for the gas appliance man are that the law has no terrors for him who takes prudent care in making installations; the law's penalties are reserved for the negligent. It therefore behooves every appliance man to know just what constitutes negligence.

Natural Gas *for the* Homes *of* Fort Collins --*the* First Change-Over *in* Colorado

By Geo. Wehrle
Superintendent, Gas Department, Public Service Company of Colorado

FORT COLLINS, Colorado, county seat of Larimer county, home of the Colorado Agricultural college and the largest city in northern Colorado, is now using natural gas, establishing the record of being the first city in the state to change from manufactured to natural.

The Wellington field, which supplies Fort Collins, was brought in on Armistic Day, November 11, 1923, by the Discovery well. A few months later, the Union Oil Company of California brought in the Mitchell well, 80,000,000 foot gasser, the largest gas well of the state. After burning for two months, the Mitchell was finally harnessed and it is from this well that Fort Collins is supplied.

The pipe line from the field to the city of Fort Collins is 14 miles long, of 6 inch welded steel pipe. In this distance, one river and six major irrigation ditch crossings were made. The line was buried 2½ feet below ground, a Parson's trencher being used for this purpose. Installation of the line was started November 13, 1925 and natural gas was turned into the city mains during the afternoon of December 11, 29 days later.

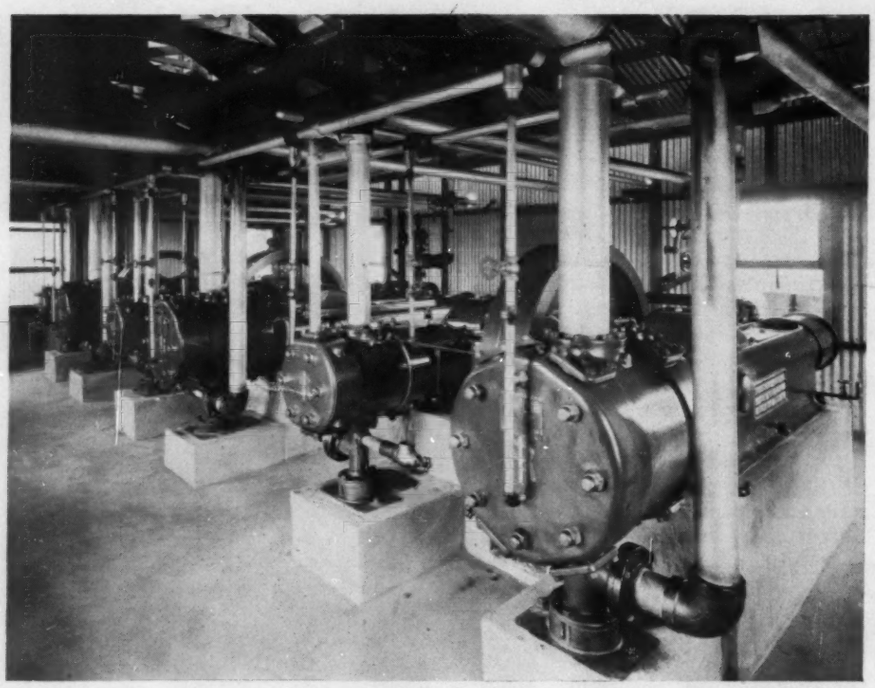
A crew of men specially trained for customers' installation work started early in October to install the Empire demand meters on all customers, completing this meter work about a week before the natural gas came to the city. The day following the change these men again started to cover the town, adjusting appliances and installing orifices in the demand meters. Each fitter was accompanied by a new business representative who explained the rate to the customer and obtained his or her signature on the gas service contract.

By order of the City Council, the Doherty Three Part Rate was placed in effect in Fort Collins with the change to natural gas. This rate, which has proven successful in Ottawa and Salina, Kansas, and other natural gas properties, consists of a $9.00 per year customer charge, a 40 cent per thousand cubic feet commodity charge and a yearly reservation charge of 32 cents for each cubic foot per hour reservation.

An interesting feature of the change to natural gas at Fort Collins was the effect on the daily sendout. The day preceding the change, the sendout for 24 hours was 167,000 feet. The day after the change this figure dropped to 85,000, about one-half of its former value. A steady increase in sendout occurred, reaching 100,000 on December 17, 125,000 on December 27 and 140,000 on January 1. Installation of house-heating equipment was carried on at a rapid rate and the effect of the house-heating load was very noticeable, the daily sendout increasing to 230,000 on January 12, and reaching a maximum on January 22 when 307,000 was sent out. The consumption for January was 7,116,000 cubic feet, a daily average of 229,700 cubic feet.

Great enthusiasm and interest prevail in Fort Collins about the natural gas. The city is unanimous in declaring it a fine thing, both for the present citizens and as a means of helping the growth of the town.

Some construction views of the laying of the Fort Collins line. Oval: At work on the Eaton Ditch crossing. Above: A section of the new line, fresh-laid from the wells through snow-covered fields of northern Colorado. Left: The Poudre River crossing—no barrier to natural gas.



An interior view of central compressor plant of E. J. Miley Oil Company at Lomita, Calif., flowing entire production by Loomis Oil Well Control Company's process. Ingersoll-Rand compressor installation.

The Importance *of* Gas Flow Methods *to* Gasoline Plants

By M. W. Haines
Gas Engineer, Loomis Oil Well Control Company

THOUGH methods have only recently been perfected to produce oil wells on an efficient commercial basis by the introduction of high pressure gas and various devices, patent records show that the basic idea is not a new one, having been cited and proven in the late 80's, as being possible but not practical at that time. During the past year considerable time and money have been spent by the oil industry, searching out the various theories, patent devices and systems used to increase the present as well as the ultimate production of oil wells, through the medium of natural gas applied under pressure. Little thought, however, has been given to the effect on the gas, as to the quantity involved, or its quality before and after its introduction into an oil well. These are factors that must be considered to justly determine the real merit of any system to increase production, and factors that are of utmost interest and importance to the oil industry at large.

Gas of Increasing Importance

Until relatively lately the oil producer has thought in terms of barrels of oil, as to the value of a well, taking the revenue derived from the gas produced as a bonus, important, of course, but not enough so to justify expenditures to conserve it or increase its gasoline content. However, with the successful introduction of the new processes of production, by the use of high pressure gas, the gas question becomes an important item to be considered, due to the volume of dry gas to be procured and the volume and quantity of wet gas to be treated by the gasoline company.

To illustrate the importance of the gas consideration, let us observe a typical example of a properly designed and installed process. We find one half million feet of dry gas being introduced into the well in question per 24 hours, with the return of three quarters of a million cubic feet of wet gas per 24 hours, with a gasoline content of 1.84 gallons per thousand Newton test. Previous to this installation this well was making approximately one-eighth of a million cubic feet of wet gas per 24 hours, with a gasoline content of 1.25 gallons per thousand Newton test.

Notwithstanding the fact that the oil produced was lowered in gravity one degree Baume, the revenue to the lease holder from this source (even though he is getting a nominal royalty on the gasoline produced from this gas) was more than doubled. Therefore, the lower series of hydro-carbons used in the production of commercial gasoline are worth more to the lease holder in the gas than they are in the oil, within reasonable limits.

Gasoline Plant Owners Gain

With this system the advantages to be gained by the gasoline plant owners are readily apparent, for the richer the gas to be treated is in the desirable hydro-carbons, the greater are his profits per gallon of refined products; likewise the greater the volume of this gas to be treated, the greater are his profits.

A practical illustration of the advantages to be gained by a gasoline plant owner is seen in the example of one plant operator who is treating wet gas from a lease which recently has increased production by gas flow methods. This gasoline company was previously contemplating the abandoning of one of its plants, but with the gas increase in volume and quality, was able to utilize all plants and launch a construction program which doubled the gasoline output.

However, there are on record a few cases where oil wells have been blown or produced by gas under pressure where the so-called wet gas was inferior to the gas produced when the well was on the beam, flowing on its own pressure. This condition was noticeable where experimental work was being done by the leading companies specializing in this work, and in fact still exists, sometimes, where men inexperienced in this work are trying to flow wells. It is a condition, however, that is entirely uncalled for, (except in the rarest of cases, such as in an extremely wet well), and is non-existent where the right gas pressures and gas oil mixtures are maintained in the hole.

Gas Is More Stable

Another point of interest and importance to the gas industry, relative to the correct flowing of oil wells by high pres-

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The Mechanism *of* Combustion *and* Measurement *of* Heat, Subject *of* Appliance Lecture

By Walter M. Berry

TO LAY A BROAD FOUNDATION for future work in the course of study in gas appliances which is under way in Los Angeles the introductory lectures were arranged to cover certain fundamentals such as "Gas Manufacture," "Gas Distribution," and the subject of combustion, treated in the lecture reported in this issue. Mr. Berry, who delivered the lecture on combustion, is directing the course for the Gas Appliance Association of Southern California, the course being presented under the auspices of the extension division of the State University. Lectures to be published in early issues will deal with space heating, gas ranges, utility cooperation, costs and profits, and kindred topics of concern to the gas appliance retailer.

COMBUSTION is the union of an inflammable substance with oxygen, producing light and heat. The inflammable substances in the gas supply are composed of only two chemical elements — carbon and hydrogen, although these two elements are united in varying combinations and form the benzene, ethylene, methane, and ethane usually found in city gas.

At usual temperatures, oxygen unites very slowly with most substances; however, as the temperature is increased the speed of this action is accelerated. One example of oxidation is the rusting of iron, which consists of a slow union of the metal with oxygen in the air. In this particular case, no apparent action is noted at ordinary temperatures, but if the temperature is increased very considerably, heat and light are at once observed.

The oxygen required for all ordinary combustion is secured from the air. Air is a mechanical mixture of oxygen, nitrogen, water vapor, a small amount of carbon dioxide, and some inert gases, which, however, need not be considered, as they are present in minute amounts and have the same effect as nitrogen. In combustion calculations, carbon dioxide is included with the nitrogen. The average percentages of oxygen and nitrogen in the air are as follows:

	Per cent by Volume	*Per cent by Weight*
O_2	20.91	23.15
N_2	79.09	76.85

Although the nitrogen serves only as a diluent and does not enter into the combustion reaction, nevertheless it serves a most valuable purpose. Were it not for the cooling effect of the nitrogen, combustion would take place with tremendous violence: our iron utensils would catch on fire and burn with the brilliancy of our most combustible materials. In fact, fire would no longer be the servant but would become the master of mankind.

For a long time the catalytic effect of spongy platinum on homogeneous explosive mixtures of hydrogen and oxygen had been known and studied. While the experiments were performed at temperatures far below the ignition point, it was observed that the speed of reaction was a function of the temperatures and that positive acceleration occurred in almost every case.

Bone, McCourt, Lucke, and others noticed that at elevated temperatures—high enough to emit light—not only the above metals, but a great many other solids, such as refractories, had a distinct catalytic effect in increasing the rate of combustion. Surface or flameless combustion, therefore, can be defined as accelerated combustion under the influence of light-wave catalysis. This action will occur in any gas flame where there is sufficient light energy to accelerate the chemical union between oxygen and combustible. Parallel reactions such as the union of hydrogen and chlorine under the action of sunlight are well known phenomena.

II. Units of Heat Measurement

A quantity of heat is usually measured by the change in temperature that it can produce in a known mass of water. The heat unit is therefore defined as the quantity of heat required to raise the temperature of a unit mass of water one degree. As the specific heat of water is not a constant, but varies slightly with the temperature, it is further necessary in precise scientific work to specify the temperature of the water. Although the heat unit has not been defined by any international congress, it has become the general custom to express quantities of heat in terms of water at 15° C (59° F). More recently many experimenters have preferred to express their results in terms of the 20-degree calorie, and most of the calorimetric work done at the Bureau of Standards is now referred to this unit. Some engineers define it as 1/180 of the quantity of heat required to raise the temperature of one pound of water from 32° to 212° F.

The units in which the heating values (or heats of combustion) of fuels, foods, explosives, etc., are expressed are: (a) the small calorie; (b) the large Calorie; and (c) the British thermal unit, designated briefly B.t.u.

The calorie is the quantity of heat required to raise the temperature of one gram of water 1° to 15° C. The large Calorie is the quantity of heat required to raise the temperature of one kilogram of water 1° to 15° C. On the same basis, the British thermal unit is the quantity of heat required to raise the temperature of one pound of water 1° to 59° F.

III. Heat of Combustion

In addition to the number of heat units produced, the mass or volume of the substance that is burned must be expressed in the evaluation of the heating value. Thus we speak of the B.t.u. per pound of fuel or per cubic foot of gas, of calories per gram of fuel, per liter of gas, etc.

If the substance burned be a gas, the mass contained in a given volume will evidently depend on the temperature and pressure of the contained gas. Hence, in order that the term "heat of combustion of a gas" may have a definite meaning and that the results of different observers may be comparable, the volume of the gas must be referred to some standard temperature and pressure. In most engineering tests, and for the purposes of the industrial testing and measurement of gases, the standard temperature and pressure almost invariably used in the United States is 60° F and 30 inches of mercury; and the gas, for purposes of testing, is saturated with water vapor.

In stating the heat of combustion of a substance, it is necessary to give not only the number of heat units produced by the combustion of a unit mass or volume of the substance, but also the conditions under which the combustion is carried out—that is, whether the combustion takes place at constant volume or at constant pressure, whether the resulting products are cooled down to the original temperature of the substance, and whether all water vapor formed in

the processes of combustion is condensed or the products allowed to escape at a higher temperature and thus carry off sensible and latent heat.

The following definitions of heats of combustion are sufficiently precise for purposes of industrial and engineering tests.

The *total heating value* of a gas, expressed in the English system of units, is the number of British thermal units produced by the combustion, at constant pressure, of the amount of the gas which would occupy a volume of one cubic foot at a temperature of 60° F, if saturated with water vapor and under a pressure equivalent to that of 30 inches of mercury at 32° F and under standard gravity, with air of the same temperature and pressure as the gas, when the products of combustion are cooled to the initial temperature of gas and air, and when the water formed by combustion is condensed to the liquid stage.

The *net heating value* of a gas, expressed in the English system of units, is the number of British thermal units produced by the combustion, at constant pressure, of the amount of the gas which would occupy a volume of one cubic foot at a temperature of 60° F, if saturated with water vapor and under a pressure equivalent to that of 30 inches of mercury at 32° F and under standard gravity, with air of the same temperature and pressure as the gas, when the products of combustion are cooled to the initial temperature of gas and air and the water formed in combustion remains in the state of vapor.

The net heating value, according to the above definitions, is less than the total heating value by an amount of heat equal to the heat of vaporization, at the initial temperature of the gas and air, of the water formed in the combustion of the gas. For most commercial gases the net heating value is approximately 10 per cent lower than the gross heating value.

The volumes of all permanent gases vary in direct proportion to their absolute temperatures. Starting with a given volume at 0° F, it will be found to increase 1/460 for every degree Fahrenheit rise. Thus at 460° F, the volume is just double that of 0° F. In the same way, on cooling, gases decrease 1/460 of their volume at 0° F, which means that when they have been cooled to —460° F their volume would theoretically be zero. Gases, however, liquefy before reaching this temperature.

Correction of Gas Volume for Pressure

When the temperature of the gas remains constant, the volume varies inversely as its absolute pressure. This means that if the absolute pressure is doubled, the volume of the gas is reduced one half.

Measuring Pressures

Several units are used in measuring pressures with which we should be familiar. The normal pressure exerted by the atmosphere at sea level is equal to 14.7 pounds per square inch. This pressure, one standard atmosphere, is equivalent numerically to 29.922 inches of mercury column, but for simplicity and convenience the latter figure has been established as 30 inches for all gas work and is the one meant whenever standard pressure is referred to. The corresponding standard in the metric system is 760 mm. of mercury.

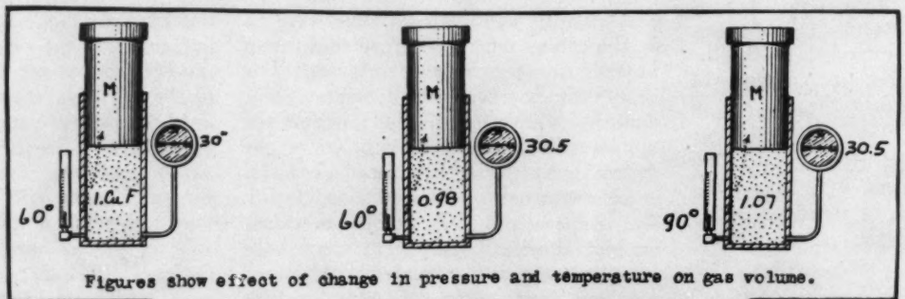
U gauge readings register the difference of the atmospheric pressure and the gas pressure. The atmospheric pressure should be determined by means of a mercury barometer and added to the observed pressure on the U gauge in order to determine the total or absolute pressure. The barometric pressure is influenced by varying air and weather conditions as well as by elevation. A drop of about one inch occurs for every 1,000 feet increase in elevation.

Effect on Gas Volume

The effect on gas volume of change in pressure and temperature of the gas is illustrated in figure No. 1, showing three cylinders containing gas. The first cylinder contains one cubic foot of gas at a temperature of 60° F and 30 inches mercury pressure. The gas in this cylinder is under what has been defined as a standard condition. In the second cylinder it is assumed that due to a change in atmospheric conditions or to pressure applied on top of the piston, the pressure within the cylinder has been increased to 30.5 inches, resulting in a compression of the gas volume to 0.98 cubic feet. In the third cylinder the gas is still under a pressure of 30.5 inches, but on account of a change in temperature of the gas from 60 to 90° F, the gas volume is expanded from 0.98 cubic feet to 1.07 cubic feet.

It is clear from these illustrations that if gas is measured through a meter at other than the standard conditions the indicated volume is either too low or too high by an appreciable amount that cannot be neglected in careful testing. Instead of making the corrections to standard conditions by using a rather complicated formula, there are tables provided that will make these corrections very easy.

A few of these correction factors are shown in the tabulation below the illustration, Fig. 1. Referring to this table, we find that in order to correct the gas volume in the second cylinder to standard conditions it is necessary to multiply the indicated gas volume, 0.98 cubic feet, by a correction factor, 1.017, in order to reduce the volume to standard conditions. In the second case, the correction factor is 0.933, and again multiplying the indicated volume in the third cylinder, 1.07, by this correction factor, the corrected volume at standard conditions is found to be one cubic foot.



Figures show effect of change in pressure and temperature on gas volume.

Temperature (Deg. F)	Total Gas Pressure--Inches of Mercury 29.5	30.0	30.5
90	0.901	0.917	0.933
80	0.930	0.946	0.963
70	0.957	0.974	0.991
60	0.983	1.000	1.017
50	1.008	1.022	1.043

CHART OF CORRECTION FACTORS FOR GAS VOLUME.

Manufactured and natural gases distributed commercially generally consist of a mixture of certain chemical elements and compounds, the more important properties of which are here briefly described.

From the standpoint of the consumer it is practically immaterial what is the chemical composition of his gas supply provided it is reasonably uniform and contains no excessive amount of inert diluent gases and no injurious constituents. At the present time it is generally regarded impracticable to define by regulation the degree of uniformity in com-

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Introducing *a* Year *of* Intensive Selling

By A. L. Crane
Managing Director, Gas Appliance Society of California

WIDELY advertised as the outstanding event of the year in gas appliance merchandising, the annual Spring Exhibit of the Gas Appliance Society of California, participated in by every unit of the organization, is about to open its collective doors to the public. Dates for this year's drive are April 11 to 17.

The Gas Appliance Society's new Membership Plaque, prominent in all campaign publicity.

Week Gains Popularity

Since the Society's organization in 1921 these sales weeks have come to occupy an important place in gas appliance retailing, and the annual drive is hailed as a welcome stimulus to interst in gas-consuming appliances. Each year has seen a 25 to 50 per cent increase in the amount of publicity placed and in the number of appliances sold during the week. Quoting results of the last two years, in 1924 some 35,000 inches of newspaper publicity were secured for the Week, and in 1925, with the same expenditure of effort and money, 73,000 inches were placed in the local press. Supplementing this were hundreds of effective window displays, and hundreds of dealers demonstrated appliances in their stores.

This year's drive is designed not merely to pad the monthly sales sheet, but to introduce a year-long campaign for the sale of more and better gas appliances. Several innovations have been made in the plans for the 1926 Exhibit. Up to this year it has been deemed necessary to use as a special incentive to the public and as an interest-creator, a special allowance on the price of all appliances sold during the Week. For instance, any cabinet range took a $5.00 allowance, an automatic water heater $5.00, low oven ranges and tank water heaters $2.50. This was simply a price appeal and did not represent the true definition of advertising—selling an acceptance, for unfortunately the acceptance which was sold during these early Weeks was for $5.00 rather than for the appliance.

No Price Appeal in 1926

But there was first need of increasing enthusiasm and in order to do this the dealer had to be shown that the public would purchase. The directors of the Society deemed it necessary in the initial stages to use any legitimate means to create an interest and for this reason they maintained the price allowance in the first four drives, depending on the future to do a more constructive work. This year that "more constructive work" is going to be done. The directors feel that the Society is firmly established enough to make the appeal on the efficiency, the economy, the need of the modern appliances as developed in recent years and thereby reach the potential buyer, rather than to appeal as in the past only to such people as had recognized the need of a new range or water heater and were looking for price rather than for efficiency.

The 1926 drive has been planned to interest the potential buyer and the motive back of the drive is replacement. All literature which has gone out to the dealer members has stated emphatically that the 1926 Gas Appliance Exhibit is a feature week, introducing a year of intensive sales effort. All printed matter, all publicity, is based on this motive and the enthusiastic reception of the advisory committee's recommendation demonstrates the fact that the membership at large is alive to the need of a more constructive method for the sale of appliances.

Preparing for the Drive

And now as to the machinery for the drive: First, came the matter of bulletins and letters to the membership, outlining the date, the motive and the objective. A poster in colors was designed and printed for window display and a supplementary poster made for use in conspicuous places, such as the sides of delivery wagons and wherever it was possible to place an eye-catcher.

A little booklet on advertising was written and published for general distribution, as it is universally acknowledged that the public at large has too slight a knowledge of the dominant factor in merchandising, advertising, to intelligently interpret the dealer's copy. It was the hope of the directors that by issuing and distributing a booklet on advertising, the public could be influenced to give more consistent thought and attention to the advertisements which are placed not alone for gas appliances, but for all commodities which make for our health and welfare.

Reading matter, stories and advertising were written and assembled in a 16-page newspaper supplement for distribution not only to the members of the Society but to the press of the State; and in this section were numberless stories with a human appeal as to the needs of equipping the world's greatest factory—the kitchen—efficiently.

Supplementing the reader matter and stories, a series of some 40 ads, each written around a talking point for gas appliances, were prepared, illustrated and spotted through the 16 pages of the supplement.

All the little accessories which go to make a drive of this character successful were prepared, such as lantern slides for the moving picture theaters, urge for better window display, a special urge for rearrangement of floor display, etc., and distributed to the membership at large.

Units Cooperate in Drive

Each Unit in the Society held a meeting for planning and discussion of the feature Week and at each meeting a special committee under the heading of "Campaign Committee" was appointed whose duty it was to see that any or all of the recommendations which the Unit had endorsed or adopted were carried out with the maximum of efficiency.

One of the unique features of the drive will be the tying in of the high school girls of the domestic science classes and the Campfire girls for the purpose of

(Continued on Page 42)

PACIFIC COAST GAS ASSOCIATION

A Department Conducted by Clifford Johnstone, Executive Secretary

Three Important Sessions Loom *on* Association Horizon

On to Arizona! April 16-17

FINAL plans for the Arizona program are nearing completion. As related in the March issue of *Western Gas,* this will be a joint meeting with the Arizona Utilities Association. The arrangements are being made by Ben Ferguson, secretary of that organization, and Claude H. Webber of the Tucson Gas, Electric Light and Power Company.

The meeting will be held in Tucson with headquarters at the Santa Rita Hotel. The Arizona Association will start its meeting on April 15 and the Pacific Coast Gas Association delegation will take part in the program at the sessions being arranged for the afternoon of the 16th and the morning of the 17th. Features of the meeting will include a luncheon with the Kiwanis Club on the 16th, with Harold Bell Wright as one of the speakers, and a dinner dance at the Country Club in the evening. Delegates are expected from all Arizona points and from Denver, Trinidad, Albuquerque, El Paso, Los Angeles and San Francisco.

Hotel reservations should be made direct with the hotel or through C. H. Webber, care of the Tucson Gas, Electric Light and Power Company. Pacific Coast delegates will find it convenient to take Southern Pacific train No. 2 leaving Los Angeles at 5:00 p. m., April 15, and arriving in Tucson at 10:10 a. m., April 16. Returning, train No. 1 leaves Tucson at 5:10 p. m., April 17, and arrives in Los Angeles at 7:30 a. m., Sunday, April 18.

The Central Arizona Light and Power Company extends a cordial invitation to those who desire to return via Phoenix.

Rush Committee Reports!

THE early date proposed for the Convention makes it necessary that committee reports and papers be turned in to Section Chairmen not later than June 1. This makes it advisable that all preparatory work such as tests, investigations, and tabulations of questionnaires be completed before the Portland meeting on May 6 so that contents of final reports and recommendations to be made, may be thoroughly discussed in the section conferences.

Several of our reports and papers last year received nationwide prominence and with the increased enthusiasm being shown by committee men this year, our Convention program promises to be a valuable one.

The following procedure should be followed by chairmen in preparing reports:

Procedure for Reports

Reports should be typed double space and all copies should be legible. Please proofread your report after it is typed. One of the copies going to the Secretary's office is for the printer. It should be either the original or the first carbon and should be accompanied by the original tracings, drawings, etc. Blueprints cannot be reproduced by the engraver.

Section Chairmen should receive by June 1 at least eight (8) copies of all Bureau and Committee reports. These copies will be distributed as follows:

Section Chairmen retain one.
Secretary's Office two (including original).
Papers Committee three.
Awards Committee two.

In addition there should be a copy for the bureau chairman and a copy for each member of the committee. As this will usually require a larger number of copies than can be made in one typing with carbon paper, it is recommended that all reports be mimeographed or hectographed, thus enabling the assembling of 50 or more copies. Extra copies should be forwarded to the Secretary's office for distribution to the technical press, etc.

Northwest Regional Meeting

THE regular Northwest Regional Meeting of the Association will convene at Portland, Oregon, on May 6 and 7. These dates are somewhat earlier than has been customery, but this is desirable as this meeting will, like other regional meetings held this year, include, as a part of its program, a day devoted to business meetings of our four sections. This practice is proving of great benefit to the committee work of the Association and promises to be reflected in the quality of reports made at the Convention. Chairmen of all important committees are expected to be in attendance at Portland in order to confer with their committee men from the Northwest in regard to the contents and recommendations to be included in reports. These meetings will take place on May 6 and will be followed by a general meeting on May 7. The complete program will be announced shortly.

Tentative Convention Dates

MR. W. M. THOMPSON, chairman of the Convention Committee has recommended that the Thirty-third Annual Convention be held at the Hotel Vista del Arroyo in Pasadena, starting on Monday, August 23. The decision rests with the Board of Directors.

This selection is a very happy one as the hotel has everything that could be desired—ample accommodations, quiet and restful surroundings, and ease of access from Los Angeles. It is situated in the midst of a twelve acre garden on the brink of the famous Arroyo Seco, through which a cool ocean breeze is always blowing. It is one of a chain of hotels under Linnard management and its cuisine and service are especially noted.

The early convention date will permit of the Convention being made a part of vacations, thus inviting the attendance of many members who could not otherwise spare the time. An unusually fine and instructive program can definitely be promised and this, together with the nearness of headquarters to the homes of so many Association members, should lead this Convention to break all records in attendance.

Committee Appointments

PRESIDENT SCHAFER announces that he has requested eight prominent members of the Association to serve on the Awards Committee, the duty of which is to review all material submitted to the Association during the year and make the awards of gold medals and of the Basford Trophy. Papers and reports submitted at regional meetings have the same opportunity of winning an award as those submitted at the Convention. The committee appointed is as follows.

H. R. Basford, San Francisco; R. S. Fuller, San Francisco; L. F. Galbraith, Oakland; A. C. Johnston, Los Angeles; H. H. Jones, Stockton; C. W. Platt, Portland; M. R. Thompson, Los Angeles; and F. H. Bivens, Los Angeles, chairman.

Papers and Reports Committee

Of no less importance to those who are now engaged in preparing material for the Convention is the President's

announcement of the personnel of the Papers and Reports Committee, the duty of which is to inspect and recommend reports for publication. F. A. Leach, Jr., S. Waldo Coleman and L. Cinq-Mars, all of San Francisco, have consented to accept this responsibility. Mr. Leach will act as chairman.

Auditing Committee

A committee to audit the books of the Treasurer and Secretary has also been chosen in the persons of Messrs. Wm. Moeller, Jr., Los Angeles; H. W. Jackson, San Francisco; and H. M. Crawford, San Francisco. Mr. Moeller will serve as chairman.

Nominating Committee

A NOMINATING Committee has been appointed by President Schafer, the personnel being as follows: C. B. Babcock, San Francisco; F. A. Cressey, Modesto, Calif.; W. M. Kapus, Portland; Hilmar Papst, Portland; A. B. Day, chairman, Los Angeles.

Billing Committee

MR. A. E. PEAT, chairman of the Accounting Section, has asked William Evans of Oakland to organize a Committee on Customers' Billing and Bookkeeping Methods, and to make a report at the Convention in regard to comparative costs of the various mechanical systems. In connection with this committee, Karl Jorgensen of Los Angeles is laying plans for a working exhibition of these machines.

Gas Appliance Manual

THE Gas Appliance Installation and service Manual prepared by the Home Service Bureau of the Commercial Section under the leadership of its chairman, R. C. Miller, has been completed in printed form. It makes a very compact and useful little book of 144 pages and members can obtain it from the Secretary upon payment of one dollar. The price to non-members is one dollar and a half. The total printing was only one thousand copies and as there were some three hundred orders received in advance of publication, it behooves everyone to order quickly. For a limited time the Secretary will take orders for reprints of specific chapters. Prices can be had upon application.

Have You Paid Your Dues?

DURING March, the Secretary mailed "last chance" bills to all whose dues for the present fiscal year remained still unpaid. The By-laws of the Association state that no one can remain a member whose dues are unpaid on April first. This rule will be strictly followed although a short period of grace will be allowed for the benefit of anyone whose conscience and checkbook may be quickened to action by this notice. Resignations, without payment, are not now possible. It is decidedly unfair for a man to receive a copy of the Proceedings, several copies of Western Gas, and other services costing real money, and then to expect to be permitted to resign. Fortunately there are very few to whom this will apply.

Dues at Half Price

THE pro-rating privilege for dues, permitted by the By-laws, becomes operative on April first for all new members applying for admittance to the Association. The new schedule covering membership for the balance of the fiscal year, or until September 30, will be one-half the regular rate, and will cover all classes of membership. The Association is well on the way toward a record year in growth, there already being 136 new members.

Resigns Chairmanship

JOHN E. SPELCE has found it necessary to resign his appointment as chairman of the Oxide Purification Committee. At the time Mr. Spelce accepted this appointment he was with the Pacific Gas and Electric Company, but his present affiliation with the California Railroad Commission does not permit him to continue with the work. J. M. Dickey, Chairman of the Purification Committee, has appointed F. C. Jones of San Francisco to the chairmanship vacated by Mr. Spelce.

New Gas Plant *to* Revive Use *of* Coal

GAS in California was originally made from coal shipped from Australia and around the Horn, before the discovery of oil and the development of oil gas manufacture. Now comes the announcement from the Pacific Gas and Electric Company that an extensive central manufacturing plant at Marysville will use coal for gas generation.

To Spend Half Million

The additional plant and gas generating equipment at Marysville, and a long distance high pressure transmission system will involve a capital expenditure of about one-half million dollars, according to E. C. Johnson, division manager for the Company. The new project reflects a firm confidence in the future of the Sacramento Valley region.

More than 10,000 consumers will be served from the central plant at Marysville. Two new coal generators, the first of their kind to be installed in California since about 1888, when a combination oil-coal process was in use, are due to be added, having a daily capacity of 3,000,000 cu. ft.

Available Coal Deposits

The large available coal deposits in Utah, and the development of coal deposits in Shasta County, Calif., with improved methods of manufacture were the factors in the return to coal gas, according to the Company. Experiments with and tests of the Shasta County coal have been made and if the deposits pan out a big development is expected there, bringing a big industry to that section of California. With these deposits proving out thousands of tons of coal will be used each month.

Development Expected

Marysville was found to be the logical location for a distribution center for a generating plant from which to service the valley. It will be possible when the territory develops to extend mains South to Lincoln, and West to Colusa, serving intervening territory. The present plans provide for a high pressure transmission main from Marysville to Oroville. This will be of eight-inch and six-inch welded steel pipe.

Improvements at Oroville

At Oroville a distribution holder plant, with compressor boosters and miscellaneous equipment will be installed. The present plant which has become inadequate to meet the growing demands for service will be dismantled. The site of the present gas works will be rehabilitated and improved. Shrubbery and lawns will be planted. To maintain this station and the northern half of the distribution system a large crew of men will be headquartered at Oroville.

GAS CONFERENCE IS HELD AT EDMONTON, ALBERTA

A conference has been held at Edmonton between representatives of the Dominion Government and the Alberta Provincial Government to discuss the handling of the petroleum and natural gas development in Alberta, in connection with the proposed transfer to the province of the natural resources heretofore administered by the Dominion Government.

COAL INDUSTRY LAUNCHES A RESEARCH PROGRAM

Recognition of the need for research in coal has been shown by the industry itself in the appointment of a research committee by the National Coal Association and the organization or research institutes by the Chicago and Detroit Coal Merchants' Association, according to the March issue of Coal.

W. V. WATSON, SAN DIEGO CO.'S CHEMIST, PASSES AWAY

On Feb. 20 W. V. Watson, chief chemist for the San Diego Consolidated Gas and Electric Company, died suddenly in a local hospital where he had been suffering from a fractured hip sustained in an accidental fall. Mr. Watson was 66 years of age and had been with the San Diego utility for the past eight years.

SO. COUNTIES COMPLETES NEW OFFIFCE AT COVINA, CALIF.

Employees of the Southern Counties Gas Company at Covina, Calif., are now housed in a modern earthquake and fire proof office located at 132 East College St. The Covina office will serve as district headquarters for patrons from Azusa, Covina, Puente and Baldwin Park, states Wm. Hayes, district manager for the Company.

EDITORIAL

A Year of Western Gas

WITH this issue *Western Gas* rounds out the first year of its service to the western industry. With the journal, as with the industry, the year has been one of growth and forward steps. We are deeply appreciative of the reader interest which has made possible this progress, and accept it as an indication that we fill a need. The existence of this need was evident at the outset, for some 200 gas men of the West signified their desire to receive *Western Gas* before our first issue was published. Now that our list of paid subscribers has mounted to the 1400 mark—more than twice the membership of the Pacific Coast Gas Association, whose members all receive the journal—we accept our increased obligation to faithfully mirror the western gas industry's advance. In some measure we hope to aid in that advance.

We take it that the successful completion of our infant period is more due to the western gas industry than to our efforts. Only because of their confidence in the present and future of the western industry have our advertisers continued to carry their messages in our pages. We have much pardonable pride in our advertising columns. The firms there represented carry prestige, set up by long-established quality in the products advertised. As the industry serves the public, so these equipment manufacturers serve the industry, and the growth of one is inseparable from that of the other.

The Gas Man's Stand on Petroleum

THE last word in the matter of petroleum resources has not yet been spoken, and columnists will speculate until the last drop of crude oil recoverable is in sight. There is no agreement among oil men themselves. Mark Requa, federal war-time oil administrator, tells the federal oil conservation board that unless new fields add to the current rate of production, eight years will see the exhaustion of the United States' total supply, on the basis of present consumption. Other equally eminent oil men find no cause for alarm in the situation, relying upon new production methods and discoveries to augment supply in the face of growing demands.

At least the gas industry is able to take an unequivocal stand on the problem of oil resources. These resources are not limitless; be it near or far removed, the day of exhaustion will come, as it has come to others of our great and apparently boundless natural assets. The question has become one of efficient appropriation of that which remains—and the industrial gas engineer has talking points which cannot be matched, when it comes to efficiency. Many a far-sighted oil man today deplores the burning of oil for fuel, where yesterday such a sentiment would not have been harbored for a moment. Gas is coming into its own as the ideal fuel on its own merits, but the petroleum situation should hasten the pace.

Quoting the Patent Gazette

A RANDOM thought lodged in the editor's head a few days ago, as he thumbed the pages of a late copy of the United States Patent Gazette. As the new patent issues flitted by—each one the crystallization of an idea, brought to form by hard work on someone's part—came the thought: Is the gas industry working? That is, is the gas industry at work in the utilization laboratory, developing new uses for gas; improving existing appliances?

Some days later the mail brought Mr. Hall's article on utilization, published in the present issue of *Western Gas,* carrying the plain accusation, from one who knows, that utilization has been too much neglected and that the time is here when the industry must face this problem or retrogress.

Certainly the Gazette will bear out this charge against the industry. Scan the pages of almost any issue and you will find that the electrical appliance patents far outnumber those for gas-burning appliances in the same field. Electric air heaters, electric furnaces, electric hotplate stoves.

The angle from which Mr. Hall's article was written is that of the gas utility. Good gas cannot be sold and kept sold unless efficient, properly-installed gas appliances exist. The present work of the American Gas Association and the Pacific Coast Gas Association, looking to the certification of gas appliances, is a noteworthy step toward higher appliance standards. In every conceivable way the "contact men" of the industry—the utility men and the appliance retailers—must strike out in the cause of utilization, actively promoting more diversified uses for gas, and better appliances in which to use it.

S. WALDO COLEMAN ELECTED TO BANK DIRECTORATE

S. Waldo Coleman, president of the Coast Counties Gas and Electric Company, Santa Cruz, Calif., is now serving on the board of directors of the Bank of California, San Francisco, as the result of a recent election.

MONTANA COMMISSION TO RULE ON NATURAL GAS

Pursuant to its decision to control natural gas distribution in the State, the Montana Railroad Commission is holding a hearing at Kevin, Mon., on Mar. 12, to inquire into the rates and service of the Blue Flame Gas Company.

H. J. BAUER NOW SERVING ON EDISON DIRECTORATE

Harry J. Bauer, president of the Pacific Gasoline Company, on Mar. 19 was elected a director of the Southern California Edison Company. Mr. Bauer, in addition to his activities in the gasoline industry, is a prominent member of the Los Angeles bar, and formerly held the post of general counsel of the Southern California Edison Company, until his resignation in 1919.

MINE BUREAU HAS BULLETIN ON NATURAL GAS SAMPLING

Methods employed in the sampling and examination of mine gases and natural gas are described in Bulletin 197, just issued by the Bureau of Mines, Department of Commerce. Apparatus for analyzing natural gas is described in the bulletin. Methods of determining heating value, the gasoline content and the density of natural gas are described. Copies may be obtained from the Bureau of Mines, Department of Commerce, Washington, D. C.

HOLD FOURTH PUBLIC RELATIONS CONFERENCE SESSION

On Wednesday evening, Mar. 31, the Los Angeles Gas and Electric Corporation public relations department held its fourth conference on public relations, under the chairmanship of Frank Weiss, new business manager for the Corporation. The program included community singing, numbers from the L. A. Service Orchestra, and a first-aid demonstration, as well as talks from representatives of several Corporation departments. Mr. Weiss gave a stereoptican lecture entitled "Some Horrible Examples," and W. M. Henderson, superintendent of gas distribution, spoke on "What Good is an Association?"

HOLDING COMPANY FORMED FOR B. C. ELECTRIC RAILWAY

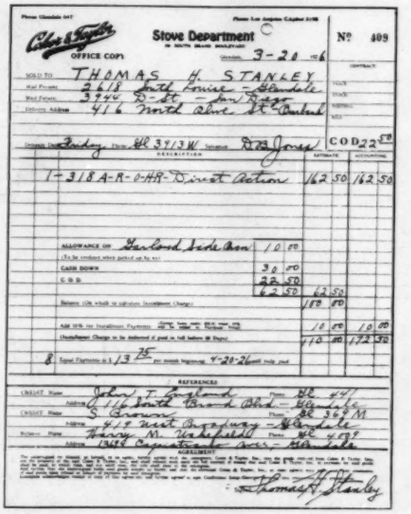
Announced as the first move toward customer ownership a new subsidiary of the British Columbia Electric Railway Company, the B. C. Electric Power and Gas Company, has been incorporated, with the issue of some $2,000,000 in shares of cumulative preferred stock contemplated within a short time. The Vancouver Gas Company, the Victoria Gas Company and the B. C. Gas Company, as well as a number of electric utilities will come under the control of the new company.

George Kidd, president of the B. C. Electric Railway Company, explained in announcing the new holding company, that the B. C. Electric Railway is an English company, its dividends being subject to English income taxes. The new company will enable the British Columbia public to share in the utility's earnings through stock purchase. The holding company's officers and directors are the same as those of the B. C. Electric Railway Company.

A Complete Order Form Simplifies Gas Appliance Records

By DONALD B. JONES

Manager, Gas Appliance Department, Coker & Taylor, Glendale, Calif.


Coker & Taylor — Stove Department — OFFICE COPY — № 409
Sold To: THOMAS H. STANLEY
2618 South Louise – Glendale
3944 D-St. – San Diego
416 North Olive St. – Burbank
Terms: COD 22.50
1-318A-R-O-HR-Direct Action 162.50 162.50
Allowance on Garland Side Arm 10.00
Cash Down 30.00
C.O.D. 22.50 62.50
Balance 100.00
Add 10% for Installment Purchases 10.00 10.00
Total 172.50
8 Equal Payments of $ 13.75 per month beginning 4-20-26
REFERENCES
Credit Note: John T. England — Phone HE 447 — 416 South Brand Blvd. – Glendale
Credit Note: S. Brown — Phone HE 3671M — 416 West Broadway – Glendale
Reference: Harry M. Wakefield — Phone HE 4709 — 1340 Cypress Ave. – Glendale
AGREEMENT
Thomas H. Stanley

The original copy, white in color, is retained as office record.

Coker & Taylor — Stove Department — DELIVERY COPY — № 409
Sold To: THOMAS H. STANLEY
2618 South Louise – Glendale
3944 D-St. – San Diego
416 North Olive St. – Burbank
Terms: COD 22.50
1-318A-R-O-H-R-Direct action 162.50
Pick up Garland Side Arm 10.00
AGREEMENT

The pink duplicate goes with the appliance installation man.

THE importance of the complete order form has confronted many appliance dealers, and Coker and Taylor of Glendale, Calif., feel that they have worked out a gas appliance order that meets every requirement. The order is made in triplicate, as shown in the accompanying illustration, the original being retained for the office records. This original contains the complete transaction, including the customer's signature. The delivery copy, by the use of carbon paper, carries that part of the original order necessary for the installation department. One-half of the delivery copy is outlined for the report of fittings, vents and material furnished free with the installation of the gas range or other gas appliance. The opposite side of the fittings section is arranged under the heading of "extra gas connections," where the installation department makes a record of all material that is to be charged to the customer.

System Is Fool Proof

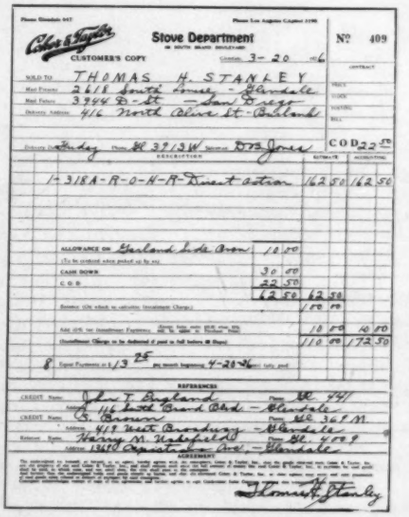
As orders are written the delivery copies are filed under daily delivery boards, one for each day of the week, making it a simple matter for the installation department to take the orders for a given day's work. When a delivery date is not specified, or is unknown, the delivery copy is held on an "advise" board at the telephone desk, and is only changed when word is received of the exact delivery day. This system is practicaliy fool-proof, providing the customer specifies the day which he really has in mind for the delivery to be made. The delivery copy does not return to the office until it is completely filled out.

Attention is particularly called to the right hand corner of the delivery copy, referring to gas conditions in the house at time of installation. The information tabulated here makes it very easy for the office to answer any questions from the purchaser regarding the gas and regulation of the oven and burners of ranges.

The Triplicate

The triplicate, containing a complete summary of the transaction, is handed to the customer at time of sale, and serves as a receipt for money paid, as well as a record of the sale and chart for future payments.

For ease of handling, the office copy is pure white, the delivery copy is pink and the customer's copy is pale yellow. This form has been used at Coker and Taylor's since the first of the year, and is being found highly useful. By this means we are going to find it easy to determine our gas appliance profits for the year of 1926—and during that year the work of the department will have been greatly facilitated by the use of this form. Considerable interest in the retail gas appliance trade has been occasioned by this blank, and hence the above description is given for the benefit of other retailers who may be interested.


Coker & Taylor — Stove Department — CUSTOMER'S COPY — № 409
Sold To: THOMAS H. STANLEY
2618 South Louise – Glendale
3944 D-St. – San Diego
416 North Olive St. – Burbank
Terms: COD 22.50
1-318A-R-O-H-R-Direct action 162.50 162.50
Allowance on Garland Side Arm 10.00
Cash Down 30.00
C.O.D. 22.50 62.50
Balance 100.00
Add 10% for Installment Purchases 10.00 10.00
Total 172.50
8 Equal Payments of $ 13.75 per month beginning 4-20-26
REFERENCES
Credit Note: John T. England — Phone HE 447 — 416 South Brand Blvd. – Glendale
Credit Note: S. Brown — Phone HE 3671M — 416 West Broadway – Glendale
Reference: Harry M. Wakefield — Phone HE 4709 — 1340 Cypress Ave. – Glendale
AGREEMENT
Thomas H. Stanley

The customer's copy is yellow in color.

Los Angeles Plant *for* Hammer-Bray

AS evidence of its faith in the Southern California market the Hammer-Bray Company of Oakland, manufacturers of the Spark Lid-top gas stove, has started construction on what is to be a fully equipped branch plant in Los Angeles. The new plant occupies several acres at South Park, opposite Seventieth Street.

Artist's drawing of Hammer-Bray Co.'s new branch plant

The building is 100 feet by 345 feet, with a floor space of approximately 345,000 square feet. It is of steel, brick and glass construction.

The present plans call for offices and show rooms, warehouse and assembly unit, and further units will be added as quickly as the volume of business demands.

The establishment of this plant will give the dealer in Spark stoves an immediate delivery from the warehouse and a factory service on any parts replacements, thereby assuring Southern California customers a maximum of service.

Natural Gas Association Meets *in* May

ON February 20, 1926, the Natural Gas Association of America had its formal founding at Kansas City, Missouri. In the 21 years which have elapsed since that day the Association has proved an instrument for much good in its industry. The "coming-of-age" convention, scheduled for Tulsa, Oklahoma, May 17-20, should draw an unusual attendance. Although it is premature to give definite features, the Association work of the past year assures a significant series of convention sessions.

With the Natural Gas Association will meet the Natural Gas Supply Men, and plans for their much-anticipated exhibition are being brought into shape rapidly. Field equipment and all manner of appliances will be on exhibition for the benefit of those interested in keeping informed on what is latest and best in these lines. The Supply Men meet in their own convention sessions on Monday afternoon, May 17.

A. W. Leonard of Tulsa, president of the Natural Gas Association of America, will call the delegates to order in the first general session at 9:30 a. m., Tuesday, May 18, in the New York Building, International Petroleum Exposition grounds.

It is not too early to reserve hotel accommodations, says Guy F. Batchelor, general secretary of the Association. Tulsa will extend a royal welcome to the gas men by all indications. The choice of location for the convention is considered favorable in view of the tremendous development the natural gas industry has undergone in the West, of recent years.

BY-PRODUCT, NAPTHALENE, NOW PRODUCED BY PORTLAND CO.

Whenever gas company by-products are mentioned the mind of the Pacific Coast gas man is apt to turn to the Portland Gas and Coke Company. This utility has built up an enviable record for utilizing "everything but the squeal"—to speak in terms of pork. Its most popular product, the Gasco Motor Fuel, is served from the pumps of 27 stations in Portland, four of them owned and operated by the gas company.

Napthalene is now being experimented with by the Company, and the time is probably close when it will be popularized with the public.

It has been used with great success by several growers of the Northwest for prevention of plant diseases and ridding plants of pests such as aphis, worms, slugs, etc. The Company is urging employees to carry on such experiments in their own home gardens.

FURNACE UNIT FOR SO. CALIF. GAS APPLIANCE ASSOCIATION

Fifteen furnace manufacturers have recently taken out memberships in the Southern California Gas Appliance Association, and are organized as a separate group within the Association, meeting twice monthly for discussion of common problems. Meetings of the furnace group are held alternately in Pasadena and Los Angeles. Members of this group also attend the general monthly sessions of the Association.

C. H. DICKEY IN HAWAIIAN ISLES FOR SIX WEEKS STAY

Charles H. Dickey, manager of the Pacific Meter Works, sailed from San Francisco on March 17th for a six weeks trip to the Hawaiian Islands. Mr. Dickey plans to return to his office in San Francisco on or about May 1st. According to some of Mr. Dickey's close friends, this is the first extended vacation he has consented to take in many years. His business activities necessitate his traveling not only up and down the Coast, but throughout the eastern part of the country as well. It is understood that he took his golf equipment with him and golf title holders of the mid-Pacific may look to their laurels.

PIPE LINE TO BE LAID FROM FORT COLLINS TO CHEYENNE

Citizens of Cheyenne, Wyo., will be using natural gas before many more months, as a result of a 27-mile pipe line being laid by the Colorado-Wyoming Gas Company, subsidiary of the Cities Service Company. The line to Fort Collins recently completed is described in this issue of *Western Gas*. Already the company has purchased 140,000 feet of double length six inch pipe, which will be laid when the frost is out of the ground. Welded joints will be used, with Dresser coupling, at intervals. The natural gas should be in Cheyenne by June 1, according to the Colorado-Wyoming Gas Company.

MONROVIA EFFICIENCY CLUB HOLDS SPECIAL MEETING

The Monrovia Efficiency Club, comprising all employees of the Southern Counties Gas Company in the Monrovia district, held a special meeting recently under the chairmanship of Homer Mead, president of the organization. Walter E. Keefe, district manager of the Monrovia properties for the utility, made a few remarks on the value of the "Service with Courtesy" policy.

George W. Smith, general commercial agent for the Southern Counties Gas company, made the principal speech of the evening, speaking at considerable length on the Company's merchandising policy. He discussed many features of an ideal salesman's talk, explaining the high lights of a gas range sale as well as those of a gas heater, demonstrating his address by referring to a Roper gas range and a Humphrey Radiantfire heater which were on the speaker's platform. Mr. Smith's talk was well received by the Efficiency Club members, many of whom participate indirectly in the sales plan of the Company.

Following the business meeting of the organization, a social program was staged by the committee in charge, a light supper being served, with dancing and music following.

HOQUIAM, WASH., OFFERED NATURAL GAS SERVICE

At its weekly meeting of Mar. 10 the city commission of Hoquiam, Wash., was petitioned by the New York Oil and Gas Company, Aberdeen operators, for a franchise to serve the city with natural gas. Although the company has not announced discovery of natural gas in its drilling operations it is understood that indications are good, and also that working agreements have been made with other operators who have already developed natural gas. A franchise was also asked of the Aberdeen council in a recent meeting. Voters of the two communities will probably settle the franchise matter at elections of next fall.

GAS-FIRED INCINERATOR FOR HERMOSA BEACH, CALIF.

Claimed as the only one of its kind in Southern California the municipally-owned, gas-fired incinerator recently installed by the city of Hermosa Beach, at a cost in the neighborhood of $25,000 is now in successful operation. Gas is used to start the furnace in the morning, the garbage burning of its own combustion after gas has brought the fire bricks to the proper heat. The charges of garbage are dehydrated in a special chamber, by the heat of the combustion of the previous charges. Only one man is required to operate the incinerator, and the beach community is congratulating itself upon this efficient gas installation.

GAS STATISTICS FROM SAN JOAQUIN LIGHT & POWER

Figures contained in the annual report of the San Joaquin Light and Power Corporation, with headquarters at Fresno, Calif., show 716,598,500 cu. ft. of natural and manufactured gas sold in three cities during 1925, and 2,970,189,347 cu. ft. of natural gas used in the generation of electricity in 1925.

GAS SALES MEETING HELD AT WALLA WALLA, WASH.

At the gas sales meeting held by the Pacific Power and Light Company at Walla Walla, Wash., in February a school in gas selling was conducted. A demonstration on smooth-top ranges was also given, and salesmen were instructed in proper adjustment of gas appliance burners.

NEW L. A. G. & E. ELECTRIC SHOP GIVES MORE SPACE TO GAS

The Los Angeles Gas and Electric Corporation's Electric Distribution Shop has been moved into new quarters, a modern structure at 1324 Wall St., built at a cost of $367,000. Gas Distribution now has the 7th and Channing Streets shop entirely to itself, having shared space hitherto with Electric Distribution.

LATTIMER STEVENS COMPANY HAS BOOKLET ON EQUIPMENT

The Lattimer Stevens Company, Columbus, Ohio manufacturers of gas equipment, have issued their catalogue No. 16, containing description of meter connections, meter shelves, stop cocks, stop cock seals, meter seals, swivels and caps manufactured by the firm.

AN ADVERTISING TIE-IN FOR GAS COMPANIES

Supplementing the advertising campaign for gas being carried on through 27 national trade and class publications by its industrial section the American Gas Association is offering to provide gas companies with an advertising service which will tie in with the campaign. Member companies have been sent samples of a series of ads, and mats will be provided for any they wish to order.

SALT LAKE UTILITY ASKS FOR DECREASE IN RATES

For the eighth time in 18 months the Utah Gas and Coke Company of Salt Lake City, Utah, has volunteered rate cuts. The last four decreases bring a reduction of 50 per cent for manufacturing users, six per cent for industrial users, six per cent for house heating, and four and a half per cent for house heating. Geo. R. Horning, general manager of the utility, states that the new rate cuts mean a decrease of $12,000 a year in revenue.

NEW ORSAT APPARATUS FOR GAS ANALYSIS IS DESCRIBED

Bureau of Mines technical paper No. 320 describes the modifications which have been introduced in the Orsat apparatus for gas analysis, as used in the Bureau's laboratory at Pittsburgh, Pa.

TUSCON, ARIZ., GAS RATES NOW BELOW PRE-WAR LEVEL

Recent reduction of gas rates by 13 per cent in Tuscon bring a $15,000 decrease in revenue to the Tuscon Gas, Electric Light and Power Company, and put gas rates below the scale in use before the war, according to Sam Headman, manager of the company. Electric rates were also reduced by 16 2/3 per cent. Gas now sells at $1.80 a thousand, reduced from $2.00. On a graduated basis the rates scale down to 85 cents a thousand for more than 25,000 cu. ft. monthly.

SPOKANE EMPLOYEES SUPPORT COMMUNITY CHEST

One hundred per cent support of the community chest program is the boast of each of the five departments of the Spokane Gas and Fuel Company. The chest drive in Spokane has just been concluded, with gas company employees subscriptions totalling considerably more than in previous campaigns.

SERVICE PINS FOR SAN DIEGO COMPANY EMPLOYEES

Twenty-eight employees of the San Diego Consolidated Gas and Electric Company received service pins during December, 1925, two having been with the company 10 years, 17 five years and nine for one year.

General Gas Light and Babcock Display in P. G. & E. Windows, San Francisco

Utility Aids *in* Dealer Exhibit

ONE of the most interesting of a series of window exhibits of gas and electric equipment seen recently in the San Francisco division offices of the Pacific Gas and Electric Company was that of the General Gas Light Co., and the C. B. Babcock Company. The Humphrey Radiantfire and the Babcock Furnace were the products displayed.

A model of the Babcock Furnace occupied the center of the exhibit, with placards on both sides which called attention to important features of design or materials used. Around this group, representative models of the Humphrey Radiantfire, ranging from inexpensive black-enameled types, to a beautiful Old English period model, were arranged. Small cards for the Humphrey Radiantfire exhibit were also included.

The whole display was planned to secure the interest of passing shoppers and others who go by the Pacific Gas and Electric Company's windows at the rate of several thousand every day. As expressed by the Company—quoting the words of a poster which appeared in the window—"This merchandise is displayed by us—

First, as an expression of our appreciation in being allowed to assist in its manufacture through the medium of our electric and gas service; second, to call attention to the value of daylight lighting (of windows) to overcome most of the street reflections upon the window glass, and third, to offer you the assistance of our sales engineers in the application of our commodities for Lighting, Heating, and Cooking, for the home, store, or factory."

The series of window displays of gas and electric appliances which is being shown by the Pacific Gas and Electric Company, San Francisco division, is an example of one effective method by which a gas company can cooperate with manufacturers in promoting the use of gas for various household and industrial purposes.

THIRD STORY ADDED TO L. A. HOME OF PACIFIC METER WORKS

The Pacific Meter Works is adding a third story on its Los Angeles building, located at 2118 Atlantic Street, to take care of increased Southern California business. Adding another story will give 7,000 square feet more of floor space, making a total of approximately 21,000 square feet in the structure. The first and second stories of the building are to be used for assembling and adjusting while the third story will be used largely for the storing of equipment. The present building was erected about one year ago. Completion of the third story addition will be made early in April.

CENTRAL ALBERTA OIL AND GAS ASSOCIATION FORMED

At the first annual meeting of the Central Alberta Oil and Gas Association, held at Edmonton, Alberta in February, final organization of the Association was effected, and the following officers elected: W. R. Howson, (Edmonton)- president; J. O. Williams, secretary; N. C. Legge, treasurer. With 82 members reported for initial enrollment and another 40 expected by the end of February the new group would seem to be off to a good start.

SAN DIEGO CO.'S ACCIDENT-SICK BENEFITS TOTAL $6,000

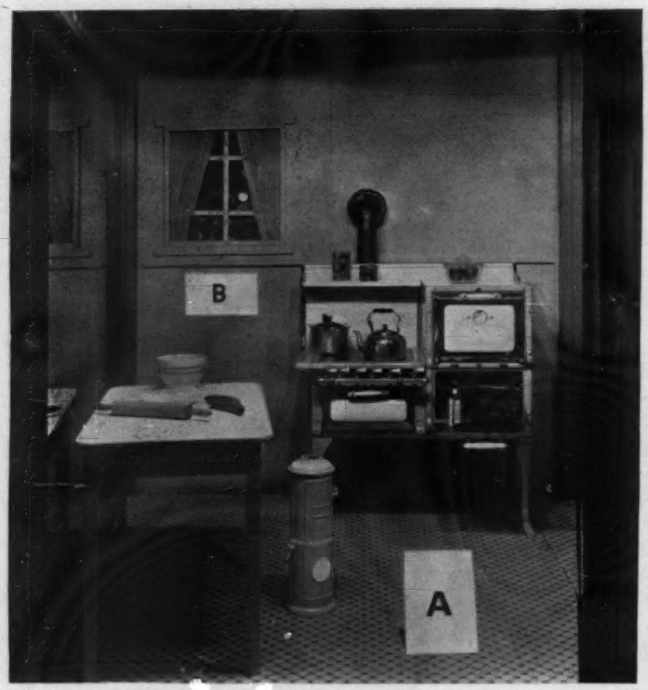
Accident and sick benefits paid out by the Employees' Association of the San Diego Consolidated Gas and Electric Co. in 1925 amounted to $5,572.50, which was 72 per cent of the revenue from initiation fees and dues received by the Association during the year.

1,000 ARCHITECTS APPLY FOR A. G. A. CONTEST PROGRAM

Countrywide interest among architects is being displayed in the American Gas Association's recently announced contest for design of a modern gas-equipped home, 1,000 architects having applied for programs outlining the prize contest details.

DISCOVERY WELL OPENS TEXAS-NEW MEXICO TERRITORY

Discovery of a saturated oil sand in the Maljamar Oil and Gas Corporation's wildcat well, 45 miles east of Artesia, New Mexico, is thought to presage an active oil-drilling campaign in southern New Mexico and western Texas. The well exhibits considerable signs of gas pressure and shows high gravity oil. It is being drilled on the Baish Permit in Lea County, Texas.



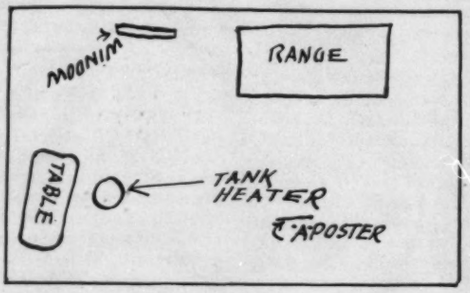
Any dealer can reproduce the window shown on the left at a cost of about $4. Its effectiveness is due to its simplicity and its tone of quality.

Featuring *the* Gas Range

THROUGHOUT the year the gas appliance dealer will find much use for windows featuring the gas range, and above is illustrated a display which will be found highly effective in its simple suggestion of an orderly kitchen interior.

In reproducing the display, use two pieces of wall board for background. Beaver board, Upson, or Cornell may be used. These pieces are each four feet wide, giving an eight foot back to the window. Kalsomine, Alabastine or any cold water tint in pale green, blue or tan may be used to color the background.

On the upper left hand corner, 12 inches from the top and six inches from the left side cut a hole 24″ by 24″ and nail 1″ by 1″ finished lumber strips on the back of the opening facing the inside of the store, as shown in the illustration above. Next make a 24″ by 24″ frame of the 1″ by 1″ strips and nail on side of window opening facing the sidewalk. At top and bottom of the frame nail two strips of finished lumber (1″ by 2″), 28 inches in length. Ordinary scrim will serve as curtain material for this window. Pin the curtain to the store side of the window, draping it as shown.



The range should be placed well to the right of the display, and at the back. Place the kitchen table at the left and front, with the tank heater on the floor about six inches from the center of the table. Placards A and B to carry sales messages as shown. Cooking utensils and appropriate foodstuffs will add to the effectiveness of the window. For best results use white enamel throughout.

The window as described will cost approximately $4.00 to duplicate.

Western Gas will appreciate receiving photographs of any reproductions of this display that are made by our readers.

T. G. ARROWSMITH MOVING TO NEW QUARTERS

T. G. Arrowsmith of San Francisco, western representative of several eastern manufacturers of gas appliances, will move within a few weeks from his old location at 135 New Montgomery, to the new building which he will share with the H. R. Basford Co., at 663 Howard Street.

SO. CALIF. GAS CO. WILL BUILD 10,000,000 CU. FT. HOLDER

At its No. 3 plant at Slauson and Western Avenues, Los Angeles, the Southern California Gas Company will soon construct a 10,000,000 cu. ft. gas holder of the new waterless type. The holder is of German design. It will adjoin the Company's 3,000,000 foot holder and will be located on that part of the property lying at the corner of St. Andrew's Place and Sixtieth Street.

F. J. Schafer, general manager of the Company has made several suggestions on the holder design as a result of his recent trip East.

HUMPHREY ROTISSERIE OPENS NEW SALES POSSIBILITIES

Capitalizing on the ancient advantages of the open fire for preparation of meats, fish and fowl, the General Gas Light Company has brought out a gas appliance known as the Humphrey Rotisserie, which is already being met with a healthy demand, according to C. B. Babcock, Pacific Coast manager of the company. The device opens up a wide field for appliance sales, being especially adapted to use in hotels, restaurants, clubs, short order houses and large homes. A circular recently prepared by the company describes the Rotisserie in full.

A. G. A. INDUSTRIAL SECTION DOES EFFECTIVE WORK

Much desirable publicity is being given gas as an industrial fuel by the industrial section of the American Gas Association. A recent accomplishment was the preparation and distribution of an attractive 34 page booklet entitled "Gas, the Ideal Factory Fuel," which expounds the merits of gas and describes its use in a number of typical industries.

NEWSPAPER SECTION IS FEATURE OF CAMPAIGN LITERATURE

If anyone is looking for colorful literature on domestic use of gas we refer him to the newspaper section gotten out by the Gas Appliance Society of California for use in its Spring Campaign. Appropriate editorial contents dealing with gas and gas appliances in the home are provided as a help to newspapers in preparing a Spring Campaign section in local communities.

H. J. KNOLLMAN AT CERAMIC ENGINEERS CONVENTION

H. J. Knollman, ceramic engineer for the Los Angeles Gas and Electric Corporation, returned early in March from attending the annual convention of the American Ceramic Society, held February 8 to 13 at Atlanta, Georgia, at which he presented a paper on refractories for the oil gas industry. The paper was delivered as a part of a symposium on refractories, held by the refractories division of the society. Mr. Knollman, on his return trip, visited the plants of the United Gas Improvement Company at Philadelphia and of the People's Gas, Light and Coke Company at Chicago, inspecting refractories equipment and generator design.

S. J. HALLS HAS NEW DUTIES WITH B. C. ELECTRIC RY. CO.

S. J. Halls, formerly manager of gas sales for the Victoria office of the British Columbia Electric Railway Co., Ltd., is now engaged exclusively with electric lighting and power sales, Mr. Hewling, gas superintendent, now being in charge of gas sales.

PACIFIC GAS RADIATOR FILLS LARGE ORDERS IN MARCH

Two large contracts for gas heating equipment were awarded in March to the Pacific Gas Radiator Company, Los Angeles, according to an announcement of C. O. Menig, sales manager of the Company. One order was for seventy eight gas steam radiators for the Phil-Ben Hotel, Los Angeles, a class A structure with seventy-five rooms. Another large installation is now being made in the Stockton building at Santa Barbara, a combination store and office structure. Twenty-seven gas steam radiators are being placed in the store room and sixty-seven vented cast iron radiators are being used to furnish heat for the same number of offices on the upper floors.

WILDCATTERS SEEK NEW FIELDS IN COLORADO

Wildcatters are drillling ten new wells in various parts of Colorado in search of new fields. About 27 wells are shut-down at various depths waiting for the spring weather to allow operations.

COLUMBIA HOME STUDY GAS COURSE IS POPULAR

Representatives of 168 gas companies, three public service commissions and eleven manufacturers, to the number of 791 have registered for the home-study course on manufactured gas at Columbia University.

CRUDE OIL-NATURAL GASOLINE MIX FREIGHT RATES

According to a report recently made to the Interstate Commerce Commission by Examiner Burton Fuller, crude oil-natural gasoline mix will be subjected to the payment of freight rates which are equal to those on usable gasoline.

SURPRISE PARTY DRAWS 1,500 ATTENDANCE IN SAN DIEGO

A recent party of the Employees' Association of the San Diego Consolidated Gas and Electric Company, arranged on a four-day notice, brought out an attendance of more than 1,500, which speaks well for the interest taken in the Association.

40,000 000 GASSER BLOWS IN AT VENEZUELA FIELD

The Standard Oil Co. of New Jersey La Danta well drilled in the eastern part of the Buchivacoa district, State of Colon, Venezuela, has blown in with a gas flow estimated at 40,000,000 feet a day. This development indicates a new gas area and probably an oil field.

PUBLIC UTILITY COURSE AT COLORADO UNIVERSITY

A course in the economics of the public utility industry has been added to the curriculum of the University of Colorado at Boulder. A number of Public Service Company men are on the faculty, which indicates that the course will be conducted along practical lines. Correspondence instruction will also be given in the utility work.

SO. COUNTIES REPORTS OPERATING REVENUE FOR 1925

Southern Counties Gas Company of California reports to the Railroad Commission its 1925 operating revenue at $5,369,160.25, as compared with $5,261,269.04 for 1924. The operating expenses, excluding taxes for 1925, are reported at $3,700,494.04, and at $3,440,-256.21 for 1924, leaving net operating revenue of $1,668,666.21 for 1925, and $1,821,-012.83 for 1924.

APPLIANCE STUDENTS CONDUCTED THROUGH ENAMELING PLANT

Smoot-Holman Company, Inglewood, Calif., manufacturers of porcelain enamel for gas ranges and hollow ware of all kinds, held open house on the night of March 18 to the students of the gas appliance course being conducted in Los Angeles by the Southern California Gas Appliance Association.

Some 75 men enrolled in the course, and many of their wives and family, went through the Smoot-Holman plant under the direction of C. E. Smoot, who explained the enameling process to the visitors. Coffee and sandwiches completed an enjoyable and most interesting evening.

When Does Legal Liability Arise *in* Gas Appliance Installation?

(Continued from Page 16)

manner in which an ordinarily prudent man would have acted under like circumstances, because, as will be later shown, if the plaintiff under such circumstances does not exercise ordinary care himself, he is guilty of contributory negligence and cannot recover.

Intervening Acts of Third Persons

A greater difficulty arises in determining the effect of intervening acts of third persons. They may be instinctive acts, negligent acts, deliberate intermeddling, or intentionally wrongful acts. As to instinctive acts of third persons, the rule would appear to be the same as in the case of such acts on the part of the plaintiff in an effort to escape injury. The test in the other classes of intervening acts of third persons is whether a man of ordinary prudence would have foreseen such acts on the part of third persons. If so, then the defendant is liable, because under such circumstances it is his duty to use due care to prevent the creation of a state of affairs where plaintiff might be injured through such subsequent acts of third persons.

Contributory Negligence on Part of the Plaintiff

There remains only the question of contributory negligence on the part of the plaintiff. This is a legal defense to plaintiff's claim for damages. It presupposes that the defendant is negligent and that his negligence contributed proximately to the damage, but it asserts that, notwithstanding defendant's negligence, the damage would not have resulted had plaintiff exercised the care which an ordinarily prudent man would have exercised under like circumstances. It is incumbent upon the defendant not only to set up this defense, but to establish it by affirmative evidence in the same manner in which the plaintiff must establish the negligence of the defendant. Of course, it may appear affirmatively from the plaintiff's own evidence that his want of due care was the proximate cause of his injury, in which case he cannot recover. For example: A sues B for injuries sustained through an explosion of gas and alleges that B so negligently installed at A's residence a gas stove that gas escaped therefrom, became ignited, and caused an explosion resulting in A's injuries. In the trial of the case, the evidence discloses that A knew gas was escaping from the stove, but that nevertheless he struck a match for the purpose of lighting one of its burners. A should not be permitted to recover, because an ordinarily prudent man, knowing that gas was escaping, and being charged with its highly inflammable and explosive character, would not, under such circumstances, have attempted to light the stove. His negligence, therefore, directly and proximately contributed to his injury.

This is the rule most generally applied by the courts, and is the rule laid down in California. Some states permit a comparison to be made between the negligence of the plaintiff and that of the defendant, allowing the plaintiff to recover if by such comparison his negligence is found to be less than that of the defendant. The difficulty in making such a comparison is obvious. The reason for the California rule, therefore, is largely one of convenience. It is not because the plaintiff's negligence excuses that of the defendant, but it is because it is impossible to apportion the damages between the parties where both of them have been negligent.[1]

To sum up the matter and attempt to answer the question by a single sentence, it may be generally said that an appliance dealer is not legally liable for damages resulting from the use of appliances sold by him unless he knows, or as a man of ordinary prudence in such business should have known, that the appliances were defective in construction, and that, with respect to the work of installing appliances or piping, he is liable only in case of the failure of himself or his employees to exercise the care which men of ordinary prudence similarly engaged would have exercised under like circumstances.

[1] 37 Cal. 409; 12 Cal. App. 207.

CALIF. NATURAL GASOLINE ASS'N HOLDS IMPORTANT SESSION

Meeting on Wednesday, Mar. 31, at the Shell Company Social Hall, Obispo and Hill Sts., Long Beach, Calif., members of the California Natural Gasoline Association held a very important general session. Officers of the newly-formed group presented by-laws for the consideration of the membership. A. J. L. Hutchinson, research engineer for the Pacific Gasoline Company, presented a paper on the "Theory of Gasoline Adsorption by Activated Charcoal."

AHLBERG GASOLINE COMPANY ENTERS CALIFORNIA FIELD

With the erection of a gasoline plant at Signal Hill the Ahlberg Gasoline Company marks its entrance into the California field, the plant being located at Lime and 35th Streets. It is to be a single-unit type, with estimated daily capacity of about 5,000,000 cu. ft. of gas. An eight-inch pipe line about a mile in length will bring gas from the northwest extension of the field to the new plant. Canadian interests are understood to be back of the Ahlberg company.

TOM TAGGART TAKES GOLF TROPHY IN PACIFIC GASOLINE TOURNEY

For the second time in two years Tom Taggart of the Pacific Gasoline Company outdistanced all contenders in the spirited intra-company golf tournament held annually by the Pacific. This year's tournament was staged on the Rio Hondo Country Club course near Downey, Calif., on Sunday, Mar. 28, eight employees breaking into the finals. Mr. Taggart played opposite B. F. Masden for final honors, turning in a card of 78, which entitled him to the handsome trophy awarded by R. E. Beckley of the Company. The trophy was a silver cigarette stand, with a life-size golf ball mounted on the lid and a miniature golf club at one side of the container.

INSTALL CLARKS AT LOMITA LONG BEACH PLANT

Two 165 horsepower Clark compressors have been installed recently at the Signal Hill plant of the Lomita Gasoline Company. To connect the plant with the northwest extension of the Signal Hill field a 10-inch gas line has also been completed by the company.

JOHN W. CRAWFORD AT NEW LOS ANGELES ADDRESS

John W. Crawford, sales engineer representing a number of companies handling gas industry equipment, announces his new address as room 200, 1855 Industrial Street, Los Angeles.

COSTUME BALL WILL AMUSE GAS MEN OF SALT LAKE CITY

The year-old Women's Committee of the Utah Gas and Coke Company, Salt Lake City, is entertaining Company employees at a costume ball in the Company auditorium Wednesday, April 7.

GAS FROM SAWDUST REPORTED IN RAYMOND, WASH.

Gas is being successfully manufactured from sawdust for use in the Raymond foundry, Raymond, Wash., making possible a high degree of heat for metal tempering. Supplying the community with gas for domestic cooking from the plant is considered a possibility.

NEW FRANCHISE PROPOSAL MADE TO DENVER COUNCIL

With its franchise expiring May 15, the Public Service Company of Denver, Colorado, is desirous of getting its draft of the new franchise before Denver voters at the earliest opportunity. To that end the new franchise was put before the public utilities committee of the city council early in March.

GAS PLANT FOR IMPERIAL TOWNS BUILDING BY MAY 1, REPORT

H. W. Burkhart, general manager of the Inland Empire Gas Company, which recently was granted a franchise to serve gas in Imperial Valley by the California State Railway Commission, states that a gas plant will be under way, either in Imperial or El Centro, by about May 1. Applications are now being received for gas service in the Valley.

SAFETY WORK STRESSED IN SALT LAKE COMPANY

Practically all employees of the Utah Gas and Coke Company, Salt Lake City, have been given instruction in first aid work, with special emphasis on the prone pressure system of artificial respiration. A Central Safety Committee has been organized in the Company, and first aid kits have been distributed throughout the departments and among the distribution gangs. Emergency calls from the general public for artificial respiration are answered by a committee for that purpose.

SUCCESSFUL COOKING SCHOOL HELD IN VANCOUVER

Introducing a series of 15 cooking schools in communities which it serves with gas the Portland Gas and Coke Company concluded its school in Vancouver on March 5. The classes, held in the Y.W.C.A., drew record crowds of Vancouver women, 275 attending the final session. Two cakes were given each day of the school as door prizes and several appliances were awarded as grand prizes concluding the school.

The cooking schools are designed by the Company to encourage more home cooking, with better appliances, to instruct the housewife in the proper care of appliances and to develop good will. So far as possible they are held in cooperation with a local newspaper, the Vancouver school being announced as the "Vancouver Columbian Cooking School." Classes are located in some civic building whenever possible, giving additional prestige to the undertaking.

PASO ROBLES GAS COMPANY ELECTS OFFICERS

A. L. Davidson of Ventura, Calif., was elected to the presidency of the Paso Robles Gas Company at a recent meeting of the directorate. E. N. Wiley was chosen to fill a vacancy on the board.

L. A. SERVICE GROUP INSPECTS CORPORATION'S GAS WORKS

About 60 members of the Los Angeles Gas and Electric Corporation's Service Group recently went through the Corporation's gas works, the members gaining much information on apparatus and processes. A lunch and program at the gas works cafeteria concluded the trip of inspection.

WESTERN STATES CONSTRUCTION SUPT. DIES IN AUTO FIRE

Oscar Beyrle, superintendent of construction for the Western States Gas and Electric Company, met his death in a burning auto wreck near Stockton on February 28.

P. G. & E. Welcomes Public

VISITORS WELCOME
DURING THE HOURS 8 A.M. TO 4 P.M.
KINDLY APPLY TO ATTENDANT
PACIFIC GAS AND ELECTRIC CO
FRANK A. LEACH JR
VICE PRES. AND GEN. MGR.

THIS PROPERTY MAY BE VISITED
BETWEEN 8 A.M. AND 4 P.M.
KINDLY APPLY FOR PERMIT
AT LOCAL OFFICE OF THE COMPANY
PACIFIC GAS AND ELECTRIC CO
FRANK A. LEACH, JR.
VICE PRES. AND GEN. MGR.

A unique plan adopted by the Pacific Gas & Electric Company, invites the public to visit its plants and properties.
The customary "No Admittance" signs will all be replaced with signs similar to those illustrated above.

SOLUBILITY OF NATURAL GAS IN CRUDE OIL

A summary of the recent investigation of the Bureau of Mines on "The Solubility and Effects of Natural Gas and Air in Crude Oils," has been made by D. B. Dow, Engineer in Charge, Laramie Field Office, and L. P. Calkin, Assistant Petroleum Chemist. In this summary data have been presented covering the effects of natural gas and air when dissolved in crude oils. These data include the effect of pressure and temperature on solution and show the relationship existing between different types of crudes with reference to their solvent action. The effect of dissolved gas on the gravity of an oil is shown. Serial No. 2732, Reports of Investigations, Bureau of Mines, Dept. Com.

DISTRIBUTION CONFERENCE AT CLEVELAND, MAY 6-8

A distribution conference will be held at Cleveland, Ohio, by the American Gas Association under the auspices of its distribution committee, May 6, 7 and 8.

PACIFIC SERVICE DISABILITY FUND STATEMENT FOR 1925

J. C. Carmody, administrative officer and treasurer of the Pacific Gas and Electric Company's employee disability fund, issues a statement for the year ending Dec. 31, 1925, showing receipts during the year of $60,-983.69, with expenditures of $26,277.51, of which $23,720.30 went for benefits. On Feb. 10, 1926, the disability plan had a membership of 4,111, representing a gain of 27 per cent over the year previous.

HAVRE NATURAL GAS CO. MAY PIPE GAS FROM BOWES FIELD

Directors of the Havre (Mon.) Natural Gas Company at their annual meeting of Feb. 15, decided to investigate the Bowes gas field with the intent of piping gas from there to Havre for general use. The proposition submitted the directors by E. J. Hubbard of Sweet Grass, to deliver gas from Bowes field to Havre was favorably received.

Officers were elected at the annual meeting as follows: president, Frank M. Cowan; vice-president, Wm. Kendig; secretary-treasurer, E. C. Carruth. Frank Kelley of Billings, Mon., was selected as superintendent to fill the vacancy left by C. F. Morris' resignation.

CONSUMPTION OF FUEL OIL BY LOCOMOTIVES

A total of 59,355,000 barrels of fuel oil was consumed by locomotives of the principal railroads in the United States in 1925, compared with 61,738,000 barrels in 1924, according to returns received from railroads by the American Petroleum Institute. These figures include fuel oil consumed in all classes of service.

L. A. SERVICE REVIEW MAKES FIRST APPEARANCE

L. A. Service Review, new quarterly journal of the Los Angeles Gas and Electric Corporation, has made its first appearance and contains some highly creditable editorial material. E. P. Ramsay, advertising agent of the Corporation, is editor of the new publication.

CALIFORNIANS USE GAS MORE CHEAPLY THAN IN 1925

Users of manufactured gas in California are paying at the rate of $90,000 per month less than at the beginning of 1925, according to the California Railroad Commission. In the northern communities of the state gas service is from five to 11 cents cheaper than at the beginning of 1925, as a result of rate reductions automatically made with changing fuel oil prices. Since mixed or natural gas is served in Southern California the companies in that section are not affected by the rate reductions.

WOMEN'S WELFARE CONSIDERED BY UTAH GAS AND COKE CO.

Evidently some pioneering is still under way in Utah; at least, the Utah Gas and Coke Company of Salt Lake City is doing some unusual and effective work among the women of that organization. A dean of women has recently been appointed to assume charge of women's welfare work in the Company. Miss Lillias Despain, holder of the new office, will direct the work of the Women's Information Committee, which is a group of women employees having as its purpose the improvement of public relations.

Meetings of the Women's Information Committee are held on the first Tuesday of each month, and topics calculated to familiarize the women employees with many phases of utility work are discussed.

COLORADO UTILITIES BOUGHT BY DOHERTY INTERESTS

Gas, iight, transportation utilities and the ice plant of Grand Junction, Colorado, were recently purchased by Henry L. Doherty & Company of New York, from Colorado Springs capitalists. Formal transfer takes place on May 1. The purchase of these utilities marks an important development for that section of Colorado, bringing assurance that expansion of the utilities will take place as fast as the communitv needs demand.

WINSLOW, ARIZ. MUNICIPAL PLANT LOWERS RATES

The city council of Winslow, Ariz., following the completion of the new municipal gas plant of that community, have voted to grant a special rate to wholesale users, to attract consumers now employing other fuel. Those using more than 30,000 cu. ft. per month will be given a rate of $1.75 per thousand, with a minimum charge of $10.00 monthly.

IMPROVEMENTS DUE IN FRESNO GAS SERVICE

Extending gas service to several points not now served, the Pacific Gas and Electric Company plans expenditure of about $175,000 on the Fresno, Calif., gas distribution system, laying six miles of new mains. Plant additions call for another $78,500. Turbine and motor driven blowers for the gas plant will cost $10,000 and a new building to house the machine shop, service department and locker rooms will be erected at an outlay of $35,000.

F. E. SEAVER NAMED L. A. G. AND E. DIRECTOR

F. E. Seaver, assistant secretary of the Los Angeles Gas and Electric Corporation, was elected to the Corporation's directorate at a meeting of the board held March 24. Mr. Seaver succeeds William van Dyke. Entering the employ of the L. A. G. and E. in 1907, he has successively held the offices of assistant bookkeeper, chief bookkeeper, superintendent Los Angeles office, and assistant secretary.

OREGON RATE INCREASE SUSPENDED BY COMMISSION

Proposed increase in the gas rate of the Southern Oregon Gas Company, affecting Medford, Grants Pass, Ashland and Roseburg, was suspended about the middle of March, pending investigation of the Oregon public service commission. The rates were to have become effective March 31.

TO TEST MONTESANO GAS FOR COMMERCIAL POSSIBILITIES

Dorsey Hager, petroleum geologist, is to test gas at Montesano for its commercial possibilities, and residents of Kelso, Wash., are much interested in the outcome. The gas was struck at the confluence of the Wynooche and Shikiles rivers, a mile and a half of Montesano.

PRODUCTION OF CARBON BLACK IS ON INCREASE

The production of carbon black from natural gas in the United States in 1924, reported to the division of mineral resources of the United States Geological Survey prior to its transfer to the Bureau of Mines, by 46 producers operating 69 plants in nine States amounted to 186,872,034 pounds, an increase of 35 per cent over the production in 1923, and nearly three times the output in 1922.

Leakage Tests *on* Natural Gas Lines

MR. E. L. RAWLINS, assistant natural gas engineer of the Bureau of Mines,. has issued a paper, Serial No. 2735, on the value of leakage tests on natural gas transmission lines. Systematic leakage surveys, says Mr. Rawlins in the introduction to his paper, not only aid in the conservation of gas, but can be made to show direct financial returns of large magnitude. He assigns the following reasons for conducting such surveys:

1. Such surveys reveal the actual leakage from the lines, and indicate repairs to be made in order to eliminate unnecessary waste.
2. Tests on lines, after repairs are made, show the actual saving that has been accomplished.
3. Tests on newly constructed lines reveal the presence of leakage that should be eliminated before the lines are put into service.
4. Tests on old systems show the amount of capital that can be invested profitably in repairs or in reconstruction.
5. Tests often reveal unsuspected sources of operating loss.
6. Leakage tests have a beneficial psychological effect upon field operators, and result in higher operating efficiency.

The Bureau of Mines in cooperation with the Natural Gas Association of America is studying leakage losses from transmission lines. Tests have been conducted on lines with screwed, rubber-coupled, and welded joints.

C. B. BABCOCK NOW ON BUSINESS IN NORTHWEST AND EAST

MR. C. B. BABCOCK, San Francisco manufacturer and gas appliance manufacturer's representative, left last week for an extended trip that will include cities in the Pacific Northwest, and manufacturing centers in the East where he will call on the manufacturers who distribute to the Pacific Coast through the Babcock organization. His return is scheduled for about the middle of May.

C. B. Babcock

NEW GASOLINE PLANT NEAR FELLOWS FOR UNITED OIL

The United Oil Company, with headquarters at Los Angeles, Calif., has completed a gasoline plant on its Calidon Lease near Fellows, Calif., operation having begun March 1st, according to Paul D. Barton, manager of the United Oil's gas department. Although the plant is a permanent installation its distillation unit at present is a Southwestern Portable, which equipment will later be replaced by the balance of the permanent plant when production conditions warrant. Gas possibilities in the new pool, while not definitely known, look encouraging, reports Mr. Barton, the gas testing about two and a half gallons to the thousand cubic feet. Construction work on the new plant was done by the Fluor Construction Company, and W. A. Taylor superintended installation for the United.

WORLD COAL PRODUCTION FIGURE GIVEN BY BUREAU OF MINES

On the basis of all the information available to the Bureau of Mines at this time, the world's total production of all coal in 1925 is estimated at approximately 1,368,000,000 metric tons. This is an increase of 13,400,000 metric tons over 1924 production.

ANOTHER ORCHESTRA FOR L. A. G. AND E. EMPLOYEES

A fourth orchestra, recruited from three already existing among Los Angeles Gas and Electric Corporation employees has been organized for radio broadcasting.

CHAMBER OF MINES AND OIL ANNUAL BANQUET, APRIL 7

April 7 is the date of the Chamber of Mines and Oil annual banquet at Los Angeles, to be held at the Ambassador Hotel. Alan E. Morphy, vice-president and treasurer of the Pacific Gasoline Company, will act as toastmaster.

PHILLIPS PETROLEUM COMPANY IS BUILDING MAMMOTH PLANT

Phillips Petroleum Company has under way a mammoth gasoline plant at Artesia, New Mexico, being constructed at an estimated cost of $1,000,000. Gas from wells in the Artesia field has already been contracted for in quantities sufficient to assure production of 1,200 barrels of gasoline daily.

NATURAL GASOLINE INCREASING IN IMPORTANCE

According to a report by H. H. Hill of the recent survey made by the Bureau of Mines of the gasoline situation, approximately 7 per cent of the gasoline output of the refineries for 1925 was from natural-gas gasoline. This amounted to about 760,000,000 gallons and represents approximately 60 per cent of the total production of natural-gas gasoline for that year. The amount of natural-gas gasoline that was used at the refineries in 1925 is equivalent to the gasoline yield by straight distillation (23.4 per cent) from approximately 77,000,000 barrels of crude oil, and the total production of natural-gas gasoline for that year is equivalent to the amount of gasoline that would be obtained from 129,000,000 barrels of crude oil by straight distillation.

PACIFIC GASOLINE ESTABLISHES CAL. TECH FELLOWSHIPS

A. J. L. Hutchinson, research engineer of the Pacific Gasoline Company, has arranged with Dr. R. A. Millikan, president of California Institute of Technology, for two fellowships in physics which the Pacific Gasoline Company is establishing in the Institute. The fellowships are for advanced work in the study of different phases of adsorption and the two students holding them will be selected by Dr. Millikan.

UTAH, HELIUM RESERVE FOR U. S. NAVY IS INCREASED

Addition of an area totaling 5,155 acres directly adjoining the reserve in Emery County, Utah, was authorized as Helium Reserve No. 1 for the Navy according to an executive order issued on recommendation of the Interior-Department.

Gas Combustion *and* Heat Measurement Lecture

position or to limit the percentage of carbon dioxide, oxygen, and nitrogen, which are the principal inert constituents; but, fortunately, limiting the variation in heating value and requiring an average heating value, which must be maintained regularly, give fairly satisfactory control of these other factors also, so that the present lack of exact requirement is not as serious as it might at first appear.

Hydrogen

Hydrogen, one of the principal constituents of manufactured gas, is the lightest of all gases, weighing only 14½ per cent as much as air. It has a very low heating value—326 B.t.u. per cubic foot—and requires the same quantity of air for combustion as carbon monoxide—namely, 2.39 cubic feet. Hydrogen has a very rapid velocity of combustion, and since oil gas contains over 42 per cent of this constituent there is a very marked variation in the character of the flame produced by oil gas as compared with natural gas. Due to the very large volume of this light constituent in manufactured gas, the weight of the total constituents of manufactured gas is but slightly more than one-half as much as that of natural gas, and this in turn has a very great influence in the volume of gas that will pass through a gas orifice with any certain pressure.

Methane

The dissimilarity that we find between manufactured and natural gas is principally due to two constituents—hydrogen and methane. In oil gas the methane varies from 25 to 40 per cent, while natural gas contains as high as 90 per cent. Methane weighs a little more than one-half as much as air, has a heating value of 1009 B.t.u. per cubic foot, and requires 9½ volumes of air for combustion.

Ethane

The quantity of ethane found in manufactured gas is so small that usually no determination is made for it. The Los Angeles natural gas contains about 24 per cent of this constituent. Ethane is slightly heavier than air, requires 16.7 cubic feet of air for combustion, and has a heating value of 1764 B.t.u. per cubic foot.

Benzene

Benzene is a heavy gas, over two and one-half times as heavy as air. It has a very high heating value—3807 B.t.u. per cubic foot—more than ten times as much as hydrogen or carbon monoxide; but on account of the fact that it is readily condensable in the gas mains with an increase in pressure or decrease in temperature and therefore produces variations in the gas quality, it is not considered a very desirable constituent if in greater proportion than one or two per cent by volume. Benzene also requires a large volume of air for combustion—35.9 cubic feet to one cubic foot of gas, and therefore produces the oily, smoky flame that often carbonizes the gas mantles.

Ethylene

Ethylene is usually found associated with benzene in manufactured gas, the percentage being small—about 2 to 4 per cent. It is slightly lighter than air, has a heating value of 1588 B.t.u. per cubic foot, and is the principal constituent of the mixture of gases called illuminants.

Oxygen

The statement is often made by consumers that there is air in the gas. This, however, is a popular misconception, since the

(Continued from Page 20)

oxygen found in the gas is a very small percentage, varying from a small trace to five or six-tenths of one per cent. Its presence is due to leakage, incomplete combustion of blast gases remaining in the generator at the end of a run, or to a small quantity of air that is sometimes introduced into the purifiers as an aid to purification. Oxygen has a detrimental effect on gas mains and meter diaphragms, and every attempt is made to keep the percentage as low as possible, although in other respects it is not a detriment but a positive aid to combustion. Oxygen is about 10 per cent heavier than air.

Carbon Monoxide

Carbon monoxide is not found in natural gas, but is found in varying quantities in manufactured gas, depending on the process used. Oil gas contains about 8.5 per cent, but due to the mixing of this gas with natural gas in Los Angeles, the carbon monoxide in the gas distributed is on the average less than 4 per cent. Carbon monoxide is slightly lighter than air and has a heating value of only 323 B.t.u.; but since it requires only 2.39 cubic feet of air for combustion, it is an important constituent where rapid combustion and high temperature are required.

Carbon Dioxide

Carbon dioxide is an inert gas weighing about one and one-half times as much as air. It is found in varying quantities in natural gas and is an unavoidable diluent in manufactured gas. Carbon dioxide increases the weight, decreases the illuminating power, and slows the combustion of gas.

Nitrogen

Nitrogen is the other inactive constituent diluent of both manufactured and natural gases. In the former, the percentage is very rarely more than 3 or 4 per cent, while in natural gas it may often be a very large percentage, depending upon the source of supply. In Los Angeles County this constituent, however, is only about one per cent. Every attempt is made to keep the percentage of nitrogen as low as possible, since it reduces the carrying capacity of the gas mains. Nitrogen is slightly lighter than air; it has a tendency to slightly slow the velocity of combustion; and it brings about a loss in utilization due to the necessity of heating it to the temperature of the combustion products.

Velocity of Flame Propagation

The important difference between the combustion of natural gas and straight manufactured gas is in part due to the slowness of combustion of the former as compared with the latter. The rate at which a flame will travel is spoken of as the rate of flame propagation, and this has been given a great deal of study by Mallard, LeChatelier, Michelson, and others. Perhaps the most accurate values, however, are those of Ubbelobde and Hofsasz, who show that carbon monoxide travels at the rate of 31.5 cm. per second, hydrogen at 200 cm. per second, and methane at 27.5 cm. per second—which shows a striking difference between natural gas, composed largely of methane, and manufactured gas, which contains a large percentage of hydrogen.

The Limits of Inflammability of Gaseous Mixtures

The fact that different gases will burn only when mixed within rather definite proportions with air is another important property of gases, which has a very great effect on gas-burner design. This important characteristic is shown in the following table; and the figures, while varying somewhat, depending upon conditions under which the tests were made, are sufficiently accurate for our purpose.

Gas	Lower Inflammable Limit	Upper Inflammable Limit
Hydrogen	4.1	60.0
Methane	5.6	14.8
Ethane	3.1	10.7
Carbon Monoxide	12.6	70.0
Benzene	1.5	8.0
Ethylene	5.7	17.5

In applying this information to appliance design, we can see that with a mixture of more than 14.8 per cent methane in the mixture issuing from the burner, it would be impossible to get a flash-back into the burner; whereas with hydrogen, the mixture would flash back up to 60 per cent of hydrogen in the mixture.

Kinds of Gas in the Los Angeles District

In the San Fernando Valley and Glendale, natural gas of 975 B.t.u. is supplied. Los Angeles, Pasadena, and Santa Monica are supplied with natural gas mixed with varying quantities of oil gas or reformed gas of 850 B.t.u. The districts south and east of Los Angeles are supplied with natural gas from local oil fields of about 1175 B.t.u.

With the typical 850 B.t.u. mixed gas supplied in Los Angeles, there is required for every cubic foot of gas 7.93 cubic feet of air, and there is formed during combustion .869 cubic feet of carbon dioxide and 1.695 cubic feet of water vapor—giving a total of 8.851 cubic feet of combustion products, including the nitrogen from the air.

In the combustion of the typical 1173 B.t.u. natural gas supplied in Los Angeles County, there is required for every cubic foot of gas 11.089 cubic feet of air, and there is formed 1.229 cubic feet of carbon dioxide and 2.198 cubic feet of water vapor, giving a total of 12.207 cubic feet of combustion products, including the nitrogen.

From these figures, it is clear how important it is that in all appliances using any considerable quantity of gas adequate provision should be made for supplying the appliance with the necessary amount of primary and secondary air, and for carrying away the undesirable, if not always dangerous, products formed by combustion.

PACIFIC GAS RADIATOR ADDS TO LOS ANGELES PLANT

J. A. Hartfield, president of the Pacific Gas Radiator Company, announces the completion of an addition to the Roseberry Street plant of the firm in Los Angeles which gives the company a total covered floor space of 50,000 square feet. Mr. Hartfield states that 1925 was the banner year for his company, sales reaching a volume never attained before since the company's founding in 1913.

NEW DUTIES FOR C. M. GROW AND F. M. BANKS OF SO. CAL.

C. M. Grow, new business manager of the Southern California Gas Company, is assuming the duties formerly those of Mr. Protheroe whose sudden death was announced last month. F. M Banks, formerly with the San Bernardino office of the Company, is now serving as Mr. Grow's assistant, as sales supervisor for all of the Company's system, including appliance sales and special contracts for the sale of gas.

A Testimonial *for* Gas Advertising

THERE is no question as to the value of advertising as an aid to the growth of the gas business, says Mr. Jordan, manager of publicity for the Pacific Gas and Electric Company. An appreciation of its value on the part of the Company is indicated by increased appropriations for the present year. During 1926 the space to be used will be increased 35%. The gas territory served will be completely covered through the use of approximately 35,000 column inches of space in columns of the daily papers in the territory served, of which there are 46 in number.

The 1926 program will be the largest and most complete in the Company's history. Maintaining a consistent policy of dealer cooperation the advertising copy will be prepared with the idea of creating a demand for gas consuming devices. Through a tie-in "See your Local Dealers" the trade will be diverted to the dealers. In addition to the larger volume of space to be used in the newspapers, direct-by-mail material will be extensively used. Special preparations were made for cooperation in the Spring gas appliance campaign.

The Pacific Gas and Electric Company has a record of being a continuous user of space for gas advertising since 1874. The first advertisements in the newspapers were small, being readers of one-column one-inch each, but that was the style of the day. The Company's business and its scale of advertising have grown together.

1925 Gas Development *in* Santa Maria

SEVERAL important 1925 developments in the Santa Maria Gas Company are reported in a letter recently received by WESTERN GAS from Chas. W. Hatch, auditor of the Company. Additions to tangible capital during 1925 totalled $76,000, an increase of $54,000 over the year previous. An increase of 214 meters is reported for the year. Approximately three miles of high pressure transmission lines were laid, with pipe strung for two miles additional; five miles of distribution line were also laid.

The Company laid 6,776 miles of high pressure main from Escolle Lease to Casmalia for oil field operations. One 1925 project of major importance was the laying of 7,315 feet of 6¼ wrought iron casing for high pressure transmission main across the Santa Maria River. This line was welded, wrapped and painted with asphaltic cement, and laid at an approximate depth of 10 feet under the bed of the Santa Maria River, involving the excavating and backfilling of approximately 75,000 cubic yards.

NEW HOME IS FUTURE PROSPECT FOR PORTLAND UTILITIES

The Portland Gas and Coke Company, the Pacific Power and Light Company and the Northwestern Electric Company, have purchased a half block of business property in Portland, introducing plans for a future new home for these utilities.

METTLER COMPANY APPOINTS COLORADO DISTRIBUTORS

The Lee B. Mettler Company, Los Angeles gas burner manufacturers, has announced the appointment of the Daly Company of Denver, Colorado, as Rocky Mountain District distributors. This district comprises Colorado, Wyoming and New Mexico.

U. S. CAST IRON PIPE GETS BIG MUNICIPAL ORDER

R. W. Martindale, Pacific Coast manager for the United States Cast Iron Pipe and Foundry Company, reports a March order which calls for 7,000 tons of cast iron pipe, secured from the Department of Public Service, of the city of Los Angeles. The order involves a cost of approximately $500,000. The pipe is for water main extension and repairs in Los Angeles.

SAYS GAS FUEL WILL OUST COAL IN FEW YEARS

That gas as fuel will in a few years take the place of anthracite and all coals is the prediction of Dr. Julian C. Smallwood, Associate Professor of Mechanical Engineering at Johns Hopkins University. Oil will be used in some cases, he believes, but its general use is impracticable.

NAVAJO LEASES MAY BE SOLD ON MAY 17 AT SANTA FE

According to Arizona and New Mexico papers there will be an auction sale of oil leases on the Navajo Indian Reservation in northwestern New Mexico and northwestern Arizona held on or about May 17, probably at Santa Fe.

PASADENA DEMONSTRATION ON ARTERIAL BLEEDING RELIEF

Fifty-six employees from the Pasadena and Alhambra gas shops of the Los Angeles Gas and Electric Corporation were present at a lecture and demonstration on arterial bleeding first aid methods, given in Pasadena by B. F. McDonald of the E. D. Bullard Company of Los Angeles. A first aid team is in the process of organization at the Pasadena gas shop.

UTAH UTILITY AIDS IN CONDUCT OF SALES COURSE

An intensive course in salesmanship is being given by the extension branch of the University of Utah, Salt Lake City, to further which worthy project the Utah Gas and Coke Company has donated the use of its auditorium as a classroom.

SEND COMPANY AD PROOFS TO AMERICAN GAS ASSOCIATION

Choice of the year's best gas utility advertising will be made by the American Gas Association soon, and it is urged that companies interested in being represented should get proofs to Association headquarters in time for exhibition at the Philadelphia convention of the Associated Advertising Clubs. Two proofs should be sent, both on coated paper.

CARBON BLACK PLANT AT BIG LAKE FIELD, MONTANA

Immediate construction of a $150,000 carbon black plant in the Big Lake field of the Lake Basin, Montana, was announced the middle of February in Billings, Montana, the United Carbon Company of Charleston, W. Va., having purchased contracts for gas from the Record Petroleum Company, which holds leases on most of the proved gas producing area in the field. The United Carbon plant is expected to handle 4,000,000 cu. ft. of gas daily at the start, and may eventually receive as high as 15,000,000 cu. ft. A life of at least 20 years is estimated for the Big Lake gas field by experts on the ground.

"Fumeless"
Gas Range

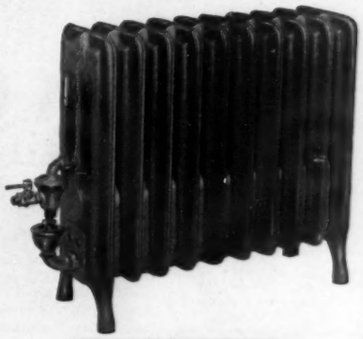
Not only the cleanest Gas Range a woman can buy, but the most appealing from the standpoint of irresistible beauty and definite economy.

Scores of dealers will feature this range during

Gas Appliance Week
April 11th to 17th

JAMES GRAHAM MFG. CO.
Largest stove works in the West
San Francisco Los Angeles
Newark, Calif.

THE LATEST



Hammel

Gas Steam Radiators

Unit System of Heating — Steam Heat in Ten Minutes

WE ARE now able to offer some very profitable territory to dealers who can qualify. The *Hammel* line offers a very liberal profit and its repeat orders will build a substantial business for you.

Good Territory for Live Dealers
Write for Literature

Hammel Radiator Corporation
715 So. Figueroa St. Los Angeles

Recreation and Good Food

Casa del Rey—largest hotel in Santa Cruz—is noted for its **cuisine.**

Gas, exclusively, is used for cooking

Come to Santa Cruz—to Hotel Casa del Rey

Rest, recreation and good food! Thousands have found new zest at delightful Santa Cruz.

Golf—Motoring—Bathing—Riding

Coast Counties
GAS & ELECTRIC COMPANY

Santa Cruz, **California**

Chas. C. Moore & Co. Engineers, Inc.
CONTRACTORS FOR COMPLETE PLANTS

High Grade Machinery

The Babcock & Wilcox water tube boilers
Corliss high speed and poppet valve engines
Babcock & Wilcox superheaters
Hamilton compressors
Green fuel economizers
Wheeler Condenser & Engineering Co. condensing machinery
Cochrane feed water heaters (open and closed)
Cochrane feed water softeners (hot and cold processes)
Cochrane feed water metering heaters
Cochrane steam and oil separators
Cochrane flow meters
Griscom-Russell Heaters, Evaporators, Distillers, Multi-Whirl Coolers
Moore automatic fuel oil regulators
Diamond soot blowers
Lagonda tube cleaners
Copes feed water regulators
Lagonda automatic boiler stop valves
Leslie reducing valves

And All Power Plant Auxiliaries

Address our nearest office for catalogs and complete information

Home Office: San FRANCISCO, Sheldon Bldg.
New York City, Hudson Terminal Bldg.
Los Angeles, Central Bldg. Portland, Gasco Bldg. Seattle, L. C. Smith Bldg.
Salt Lake City, Kearns Bldg. Honolulu, T. H. Phoenix, Heard Bldg.
Vancouver, B. C., Standard Bank Bldg.

Gas Flow Methods *and the* Gasoline Plant

(Continued from Page 18)

sure gas methods, is that the wet gas, so formed, tends to be a more stable product, besides being richer in commercial gasoline than before. Stated more clearly, the temperatures, pressures, and gas-oil mixtures, when maintained in the well in their correct relation (and there isonly one correct relation), tend to stabilize the lighter series of hydro-carbons in the gas, converting a fair portion of said hydro-carbons into a gas which is recoverable as a commercial gasoline. And this gasoline on distillation shows a marked freedom from most wild or unstable gases usually held in saturation, as well as a definite segregatio nof commercial gasoline components, which add greatly to its value, as its volumetric loss due to weathering is negligible, when compared to the losses that are now sustained, due to temporary stabilization of lighter hydro-carbons in gasoline, recovered in present day gasoline plant practice.

If intelligent consideration is given the advantages to both owner and refiner of gas coming from a properly produced oil well, it must be agreed that these methods of oil well production, especially by use of high pressure gas systems, are of much importance to the gas fraternity and are worthy of their interest and research study. The gasoline refiner especially should investigate the results of the various systems of producing the wells he is securing gas from, using his influence and technical knowledge to benefit the leaseholder as well as himself.

A. G. A. LABORATORY BEGINS TESTING OF GAS RANGES

Routine testing of gas ranges is now under way in the American Gas Association's laboratory at Cleveland, Ohio, one model each of a number of different makes of ranges being under test. After completing a cycle of range tests other models will be tested.

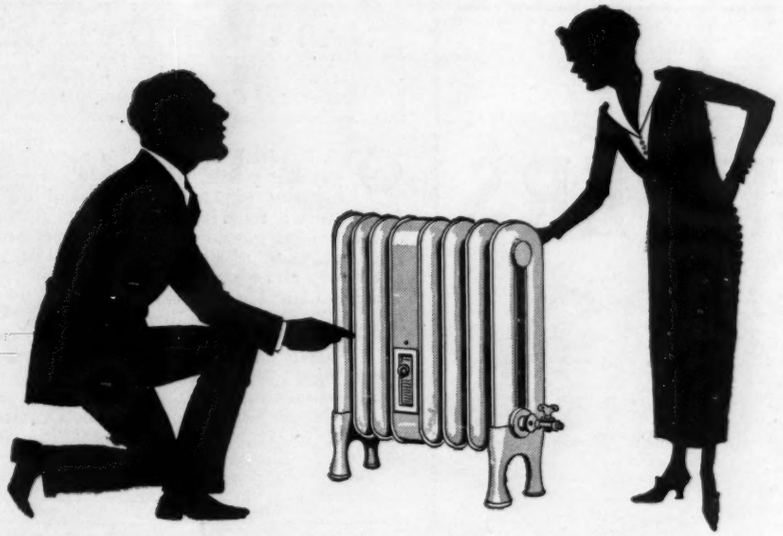
FAIRY STORIES TELL MERITS OF GAS IN UTAH CONTEST

George R. Horning, vice-president and general manager of the Utah Gas and Coke Company of Salt Lake City, Utah, recently sponsored a fairy tale contest among employees of the company, designed to sing the advantages of gas in a new way. Prize stories composed by those who compete are being printed in the Utahgas Pilot, publication of the company, and winners receive cash awards of $10.00 and $5.00.

J. C. JORDAN PUBLICITY CHAIRMAN FOR EMPLOYEES' ASSOCIATION

J. Charles Jordan, director of publicity for the Pacific Gas and Electric Company, is serving as publicity chairman for the active "P. S. E. A."—Pacific Service Employees' Association.

Do Your Customers Ever Say



"You Don't Seem to Have What I Want"

Competition is too keen today to try to sell people something they don't want! You must have a **complete** line to suit the whims and needs of your customers.

Pacific's six types of gas heating appliances fill every possible need for homes, offices, stores, apartment houses, theatres, schools, churches and factories.

Concentrate on Pacific. There is no duplication of numbers, as is the case where you handle several competing lines. You can therefore carry a smaller stock and have less capital tied up. Everything is simpler, from sales effort to bookkeeping.

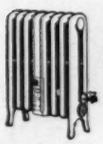
Pacific Heating Engineer Service Goes With the Line!

When you stock Pacific heating equipment you are free to call on our heating engineers for help on any particularly difficult heating problem that may come up. Largely through the efficiency of these men, Pacific installations in the Southwest are far greater than any other.

Write today for agency proposition.

See listing in Sweet's 1926 Architectural Catalog—Pages 2220-1 and 2116-7

Here are the Six Leading Types of Pacific Gas Heating Appliances — They Ventilate While They Heat.



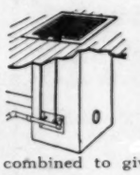
Pacific Pressed Metal and Cast Iron Radiators

An exclusive air circulation system — develops greater heat at a 25 per cent saving in gas. Sturdier construction.

Special Features.

Pacilc Gas Steam Radiators

Provide steam heat at lower cost than a central steam heating plant. Automatic control.

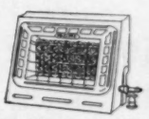


Pacific Floor Furnaces

No basement needed. Just turn a key. A pilot light ignites the gas. Instant heat. Two different systems of heating and air circulation are scientifically combined to give greater heat and less gas.

Pacific Unit Furnaces

Installed in basement or recess and supplies heat through pipes to all rooms. Upstairs control. Automatic temperature regulation if desired.



Pacific Gas Recess Radiant Heaters

Furnished in any desired finish. An air duct applies a continuous stream of fresh air to the flame. Outer casing is always cool.

Pacific Gas Radiator

Gas Heating Company Headquarters

1740 W. Washington St.—BEacon 2190 616 West 8th St.—MEtropolitan 2398

Factory and Foundry 7541 Roseberry Street, Los Angeles. Branches Throughout the West.

OIL METERS

The EMPIRE

Positive displacement, oscillating piston design.

Different from every other type of meter.

Unsurpassed in over forty years for accuracy, durability, and low cost of upkeep.

Used with highest satisfaction by

Gas Companies

in every section of the country.

Made in all sizes, ⅝ in. to 6 in., inclusive.

EMPIRE Oscillating Piston Oil Meters are fully described and illustrated in Circular 110-W. Send postal for your copy.

National Meter Company

299 Broadway, New York

Chicago Boston Atlanta
San Francisco Cincinnati
Los Angeles

NATURAL GAS GASOLINE OPERATIONS

Compiled by J. W. MASHAW

Department of Commerce, Bureau of Mines, Division of Mineral Resources and Statistics

ONE hundred and forty-five natural-gas gasoline plants, with a daily indicated capacity of 1,187,236 thousand cubic feet, report a recovery of 27,085,030 gallons of natural-gas gasoline from 20,006,339 thousand cubic feet of gas treated, in February.

Utilization of natural-gas gasoline amounted to 676,626 barrels, an increase over January of 43,266 barrels.

Stocks of natural-gas gasoline at the end of February amounted to 88,861 barrels of which 20,233 barrels were reported by natural-gas gasoline plant operators and 68,628 barrels by refinery operators. This is a decrease of 31,744 barrels under January stocks.

The production of gasoline during the month of February amounted to 138,673,038 gallons, a daily average of 4,952,608 gallons. This is a decrease of 23,014,148 gallons or 14.23 per cent under January output. Of this production 180,035 gallons were reported as finished gasoline produced by natural-gas gasoline plant operators. Compared to the production in February 1925, an increase of 22,257,038 gallons or 19.12 per cent is noted. Of the gasoline produced 404,188 gallons were from using either a cracking or synthetic process and 138,268,850 gallons from other processes.

Stocks of gasoline show an increase of 14,088,646 gallons during February and at the end of the month amounted to 412,011,503 gallons. This stock figure includes 30,363 gallons of finished gasoline reported by natural-gas gasoline plant operators.

CALIFORNIA NATURAL-GAS GASOLINE PRODUCTION, DISTRIBUTION AND STOCKS

February, 1926

PRODUCTION

Type of Plant	Gas Treated M Cu. Ft.	Natural-gas Gasoline Produced Gallons	Gasoline Recovery per MCF Gas Treated
Oil Absorption	12,552,486	17,283,609	1.377 Gal.
Compressor	355,180	495,561	1.395 Gal.
Combination Comp. and Oil Absorption	3,880,508	5,419,693	1.396 Gal.
Combination Oil and Charcoal Absorption	2,191,444	3,640,925	1.661 Gal.
Charcoal Absorption	1,026,721	222,463	.217 Gal.
Drip		22,779	
Totals	20,006,339	27,085,030	1.354 Gal.

Finish Gasoline produced at plants 180,035 Gal.

DISTRIBUTION

Stocks first of month		120,605 Bbl.
Production during month		644,882 Bbl.
Quantity mixed with crude or unfinished oils	228,429 Bbl.	
Used in blending at refineries	301,059 Bbl.	
Stocks end of month	88,861 Bbl.	
Used at Plants, Shortage and Evaporation losses	13,978 Bbl.	
Balance	133,160 Bbl.	
	765,487 Bbl.	765,487 Bbl.

STOCKS

Natural-gas gasoline held by natural-gas gasoline plant operators	849,787 Gal.	or 20,233 Bbl.
Natural-gas gasoline held by refiners	2,882,376 Gal.	or 68,628 Bbl.
Totals	3,732,163 Gal.	88,861 Bbl.

Finished gasoline (motor fuel) held by natural-gas gasoline plant operators 30,363 Gal.

SAN DIEGO CO. TO ISSUE TWO MILLION OF CAPITAL STOCK

San Diego Consolidated Gas and Electric Company has been authorized by the Railroad Commission to issue and sell at not less than par $2,000,000 of its common capital stock, and to use the proceeds thereof to pay indebtedness in making capital expenditures and to reimburse its treasury on account of earnings invested in the properties of applicant, and to finance in part its capital expenditures during 1926.

UTAH COMPANY BROADCASTS FOR PATRONS' PLEASURE

Every Friday at 10 a. m. Station KSL, Salt Lake City, Utah, broadcasts a program provided by the Utah Gas and Coke Company of that city. The Company solicits requests as to program material from its patrons, and endeavors to furnish recipes, dinner menues, etc., for interested housewives, in addition to numbers for entertainment.

HOME SERVICE DIRECTOR FOR AMERICAN GAS ASSOCIATION

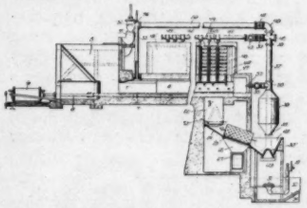
Miss A. Deane Dowell has been appointed home service director for the American Gas Association, having previously been director of home service work for the Central Hudson Gas and Electric Company at New York City. This new branch of Association enterprise represents the activities of the commercial section.

NEW DEVICE FOR MEASURING GAS FLOW IN MAINS

A recent application of electricity to the gas-producing industry is a device which records the flow of gas in a main miles distant. The device may be attached to any point of a gas main by inserting an orifice plate from which small pipes lead to a cylinder. The pipes permit the gas to flow into the cylinder which contains a float carrying an iron core. As the float rises or falls with the gas flow, the iron core moves into or out of the space between the poles of an electro-magnet.

THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

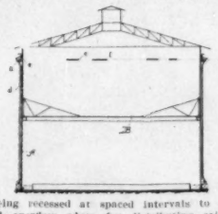
1,549,160. GAS APPARATUS. LELAND L. SUMMERS, New York, N. Y. Filed May 2, 1921. Serial No. 465,962. 2 Claims. (Cl. 48—73.)



1. Apparatus for producing gas from coal comprising a coking apparatus of a type intermittently discharging a part of its contents, a gas generator associated therewith, a feed hopper upon the generator adapted to receive the coke as discharged from the oven, and screening means interposed between the oven and generator and adapted to eliminate certain portions of the coke before it reaches the generator.

1,554,503. SEALING MEANS FOR GAS HOLDERS. KONRAD JAGSCHITZ, Mainz, Germany, assignor to Maschinenfabrik Augsburg-Nuernberg, A. G., Nuremberg, Bavaria, Germany, a Corporation of Germany. Filed July 7, 1923. Serial No. 650,019. 5 Claims. (Cl. 48—176.)

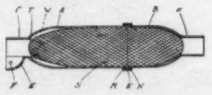
1. In a gas-holder, the combination of a container having a plurality of openings near the top thereof and including a vertically movable closing disc having a peripheral liquid seal, and means whereby a sealing liquid is caused to flow through said openings to the interior of the container, the lower edges of said openings being recessed at spaced intervals to constitute recessed overflow edges for distributing said sealing liquid in a plurality of streams over the inner surface of said container.



1,549,426. PROCESS FOR THE REMOVAL OF CARBON BISULPHIDE FROM GAS. JOHN MORRIS WEISS, New York, N. Y. Filed Mar. 29, 1924. Serial No. 702,896. 18 Claims. (Cl. 23—3.)

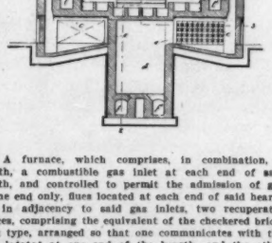
1. The removal of carbon bisulphide from gas, comprising bringing said gas into contact with a water solution of an organic amine.

1,554,534. SILENCER FOR GASEOUS CURRENTS. NICHOLAS STRAUSSLER, London, England, assignor to International Silencer Company, Limited, London, England. Filed July 6, 1923. Serial No. 649,847. 5 Claims. (Cl. 137—160.)



1. A silencer for gaseous currents, comprising a body portion built of readily detachable sections, and a filling consisting of a permeable homogeneous tangled mass of very narrow and thin ribbons of flexible metallic material enclosed in a metal bag made of foraminous reticulated sheet material adapted to fit bodily into the said body portion, said bag being composed of stiffer and stronger material than that of which the filling consists.

1,556,257. FURNACE. ALFRED SMALLWOOD, Highgate, London, England. Filed Oct. 4, 1921. Serial No. 505,414. 2 Claims. (Cl. 263—15.)



2. A furnace, which comprises, in combination, a hearth, a combustible gas inlet at each end of said hearth, and controlled to permit the admission of gas at one end only, flues located at each end of said hearth and in adjacency to said gas inlets, two recuperator devices, comprising the equivalent of the checkered brickwork type, arranged so that one communicates with the flues located at one end of the hearth, and the other communicates with the flues situated at the other end of the hearth, a recuperator system built up of a plurality of passages, with every alternate passage arranged in communication and isolated from its neighbor, to form two distinct sets of passages which are arranged so that each communicates at one end with one of the said recuperator devices, means whereby a source of fluid may be arranged in communication with the end of the passage away from the hearth of one set of passages, and a chimney stack arranged in communication with the similar end of the other set of passages, and means whereby the said passages may be interchanged with relation to the source of fluid supply and the chimney stack, and means whereby the gas inlet which is situated adjacent to that flue which is in communication with the chimney stack is maintained closed.

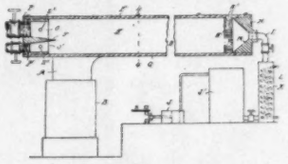
1,556,443. SAFETY GAS COCK. WILLIAM L. JACKSON Chicago, Ill. Filed Dec. 20, 1924. Serial No. 757,287 6 Claims. (Cl. 251—163.)

3. A safety cock comprising a shiftable plug, a plug housing having a cut out portion at its top to provide a pair of shoulders, the bottom of said cut out portion cut away to provide a diametrically disposed groove in said housing, a pin projecting radially from the plug stem and operating in said cut out portion between said shoulders, a depressible resilient locking member carried by the housing within said cut out portion and arranged above the bottom of the latter and further extending over said groove, said member having means shiftable in said groove and normally arranged in the path of said

pin to provide a stop to arrest shifting movement of the plug stem, and said member further provided with a shifting finger therefor, said finger arranged in said groove and projecting radially from said housing.

1,546,632. METHOD OF AND APPARATUS FOR SEPARATING MIXED GASES. DOUGLAS DOW, Ann Arbor, Mich., ELIJAH P. LOVEJOY, Princeton, Ill. and THEODORE J. CASE, Ann Arbor, Mich. Filed Sept 11, 1922. Serial No. 587,877. 16 Claims. (Cl. 183—115.)

1. An apparatus for separating mixed gases comprising an electro-magnet having poles with nonparallel adjacent faces to form therebetween a magnetic field of varying intensity, a closure for the space between said poles, forming an unobstructed passageway and means

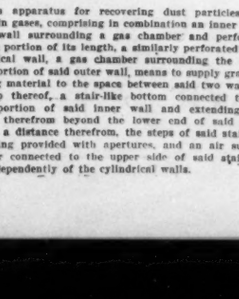


for passing mixed gases through said enclosed passageway and for separately removing the gases from the more intense and less intense portions of the field.

1,554,471. GAS TRAP. MILON J. TRUMBLE, Los Angeles, Calif., assignor to Trumble Gas Trap Co., Los Angeles, Calif., a Copartnership consisting of Milon J. Trumble, Francis M. Townsend, and Alfred J. Gutzler. Filed Apr. 16, 1923. Serial No. 632,286. 20 Claims. (Cl. 183—2.7.)

1. In a gas trap: a distributor comprising a loop channel adapted to discharge a gas-oil mixture in a stream extending around said channel.

1,549,680. MEANS FOR CATCHING PARTICLES CONTAINED IN GASES. OTTO-NORDSTRÖM, Sundsvall, Sweden. Filed June 14, 1923. Serial No. 645,443. 3 Claims. (Cl. 183—46.)

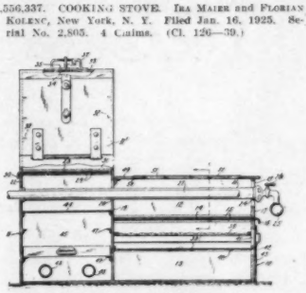


1. An apparatus for recovering dust particles contained in gases, comprising in combination an inner cylindrical wall surrounding a gas chamber and perforated along a portion of its length, a similarly perforated outer cylindrical wall, a gas chamber surrounding the perforated portion of said outer wall, means to supply granular filtering material to the space between said two walls at the top thereof, a stair-like bottom connected to the lower portion of said inner wall and extending outwardly therefrom beyond the lower end of said outer wall at a distance therefrom, the steps of said stair-bottom being provided with apertures, and an air suction chamber connected to the upper side of said stair-bottom independently of the cylindrical walls.

1,556,567. SAFETY ATTACHMENT FOR GAS COCKS. LEROY BROWN, Baltimore, Md., assignor to Harry M. Rodman, Baltimore, Md. Filed Feb. 28, 1923. Serial No. 12,439. 2 Claims. (Cl. 251—166.)

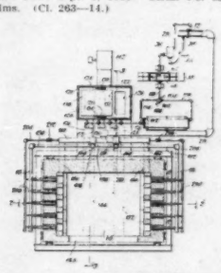
2. A safety attachment for gas cocks comprising a clamping member for securing the same to the valve means of a gas cock, a pair of puterally extending parallel arranged projections formed on the clamping member and being provided with registering openings, a latch lever mounted for slidable movement in the openings, a coil spring secured to said lever and one of said projections respectively and putting the lever under tension for automatically dropping the same to operative position, a right angle extension formed on the lower end of the lever for engagement with the gas cock to prevent the operation thereof and to also prevent removal of the lever from the projection, and finger manipulating means for the lever.

1,556,337. COOKING STOVE. IRA MAIER and FLORIAN KOLENC, New York, N. Y. Filed Jan. 16, 1925. Serial No. 2,805. 4 Claims. (Cl. 126—39.)



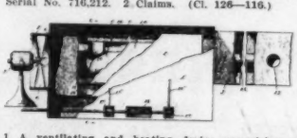
1. A stove including a burner compartment, a broiler compartment below said burner compartment, means for opening or closing, at will, the communication between said two compartments, said burner compartment including a top, and a burner within said burner compartment below said top, said burner being adapted to heat said top and said broiler compartment when said two compartments are in communication.

1,555,780. GAS FURNACE. CARL J. WRIGHT, Toledo, Ohio. Filed Sept. 5, 1919. Serial No. 321,760. 30 Claims. (Cl. 263—14.)



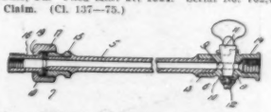
1. A process of operating a gas fired regenerative furnace, comprising passing air and fuel gas through heat storage elements to said furnace, exhausting the products of combustion through a second set of heat storage elements, reversing the direction of flow of the air and gas through the heat storage elements, causing the heat storage elements alternately to absorb heat from the combustion gases and impart heat to the entering air and gas, and varying the interval of time between each reversal inversely to the rate of supply of gas.

1,554,484. VENTILATING AND HEATING DEVICE. LEWIS R. BARBER, Fresno, Calif. Filed May 27, 1924. Serial No. 716,212. 2 Claims. (Cl. 126—116.)



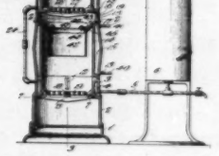
1. A ventilating and heating device comprising an outer casing; an inner casing mounted within the outer casing; an air passage mounted within the inner casing; burners mounted below the inner casing for heating said inner casing and the air passage; a gas passage mounted within the inner casing, said gas passage communicating with the space between the air passage and the inner casing through passages opening into the top of the gas passage whereby combustion products from the burners may be drawn upwardly past the sides of the air passage and into the gas passage; an outlet passage connected to one end of the outer casing and communicating with a room; a fan mounted in connection with the opposite end of the outlet casing and adapted to force a current of air past the inner casing and gas passage and through the air passage and outlet passage to the room for ventilating and regulating the temperature of the room; and a gas vent connected to the gas passage and extending outwardly therefrom through the outlet passage and carried outwardly through a side of said outlet passage at a point relatively remote from the casings whereby air moving through the outlet passage may be further heated by contact with said vent.

1,553,164. GAS-BURNER FITTING. DAVID R. HOOK, Butler, Pa. Filed Mar. 27, 1924. Serial No. 702,406. 1 Claim. (Cl. 137—75.)



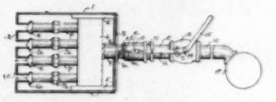
A fitting of the class described comprising a single length of lead pipe provided upon its exterior and adjacent its opposite ends with outstanding lateral flanges forming annular shoulders, a sleeve of relatively hard metal mounted upon one end of the pipe and having its inner end abutting the adjacent shoulder and having its outer end flush with the adjacent end of the pipe, the last named end of said sleeve being externally screw threaded, a nipple externally screw threaded at one end and provided at its opposite end with a flange, packing interposed between said flange and the ends of said sleeve and lead pipe, a coupling cap threaded on said sleeve and engaged with said nipple flange to swivelly mount said nipple, and a valve at the opposite end of the lead pipe embodying a casing threaded at its outer end and having its opposite inner end telescopically receiving the adjacent end of the lead pipe and bearing against the adjacent shoulder of said lead pipe.

1,553,107. HOT-WATER STOVE. SAMUEL V. REEVES, Haddonfield, N. J. Filed Aug. 18, 1924. Serial No. 732,623. 9 Claims. (Cl. 126—5.)



1. A hot water stove having superimposed water chambers, a separate source of heat for each water chamber, and an independent draft control for each source of heat.

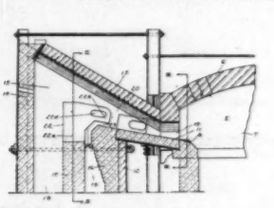
1,552,597. GAS BURNER. MITFORD B. DE LOACH and WILLIAM A. CATLETT, Dallas, Tex. Filed Sept. 24 1924. Serial No. 739,688. 6 Claims. (Cl. 158—119.)



1. An apparatus of the character described comprising a housing with doors, a grate, a plurality of burners of substantially T-shaped formation adapted to be moved to and away from said grate, a gas reservoir with a gas supply pipe, a second pipe with a valve and having air-tight connection with the gas supply pipe, and a lever for opening said valve and simultaneously moving said burners away from the grate, and opening the doors, said movement being reversed on operation of the lever in an opposite direction.

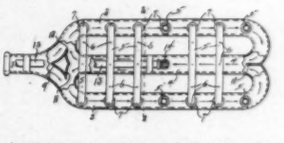
1,554,831. GAS BURNER. WALTER O. AMELER, Pittsburgh, Pa. Filed Aug. 7, 1922. Serial No. 580,074. 8 Claims. (Cl. 158—75.)

1. A burner construction for furnaces comprising an air passage, a vertical gas passage, a vertical wall within the burner, and means resting on said wall and projecting in lateral direction beyond said wall across the top of the gas passage to form a partition between the air and gas passages inside the burner structure

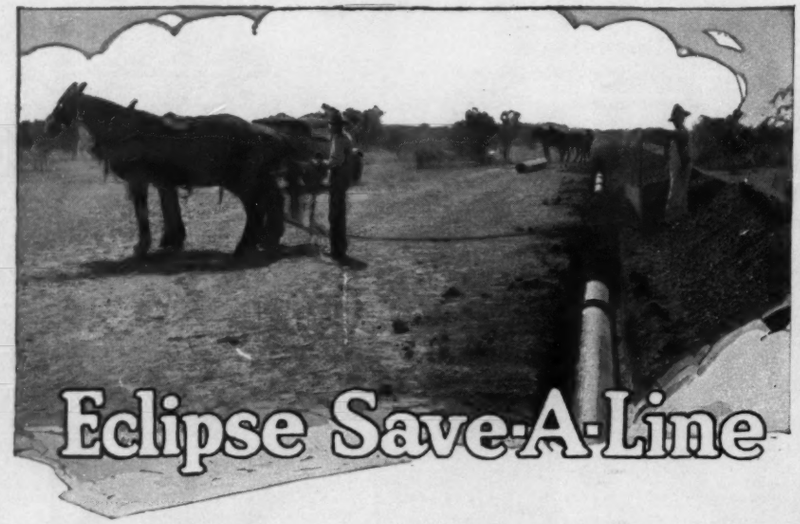


at the point of juncture of said passages, said means having its center of gravity disposed over the vertical wall whereby it is held.

1,551,532. CIRCULATING GAS BURNER. JAY M. ARTELL and FREDERICK G. VON HOFEN, Fort Worth, Tex. Filed Nov. 3, 1924. Serial No. 747,541. 4 Claims. (Cl. 158—99.)



1. A gas burner comprising gas feed members, burner arches connected to said feed members, a circulating member communicating at both ends with said feed members, means at the receiving ends of said gas feed members for directing gas into said members, means at the discharge end of said feed members for directing gas into said circulating member, and means at the discharge end of said circulating member for dividing the gas and directing the same into said feed members.



Eclipse Save-A-Line Securely Protects Hundreds of Miles of Pipe Line on The Pacific Coast.

Eclipse Save-A-Line forms a thick, elastic film or coating, reinforced with asbestos fibre, which contracts and expands with the pipe and is unaffected by moisture, alkali, lime or electrolysis. It can be applied without heating and by inexperienced labor.

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TOWN OF HIGH RIVER ASKS FOR GAS SERVICE

C. J. Yorath, president of the Canadian Western Gas, Light, Heat & Power Company, Ltd., Calgary, Alberta, has negotiations in progress with officials of the town of High River which may result in the connection of that town with the company's system through a pipeline passing through High River. The town has asked through its representatives, for gas service, both for light and heat.

FEDERAL DEPARTMENT OF CONSERVATION SUGGESTED

A Government department of conservation of natural resources may be a forthcoming suggestion to President Coolidge from the work of the Federal Oil Board. Secretary Work of the Department of the Interior, chairman of the oil board, by implication, in a report recently made public entitled "A 1925 Review of the Department of the Interior," recommends the creation of a branch of government work which would study the broad principles of conservation of natural resources and advise the state governments on methods to insure their use along sound economic lines and against misappropriation and waste.

COLORADO SPRINGS GAS PLANT SHOWS FIRST PROFITS

For the first time since Colorado Springs took over the gas plant the receipts have exceeded the disbursements. A financial statement covering a seven-month period shows gross revenue of $14,057, and net profits of $227, with a net deficit of $6,922 remaining on the gas department's balance sheet.

AUDITORIUM DONATED TO USE OF PUBLIC BY UTAH COMPANY

Women's clubs and other civic organizations in Salt Lake City, Utah, are benefiting from the publicmindedness of the Utah Gas and Coke Company, which has offered the free use of its splendidly furnished auditorium to the public. The auditorium is in the new home of the Company, in the Hooper-Eldredge Building; its acoustic properties are of the best, and the Company's contribution should be of great service to the city.

DESCRIPTIVE FOLDER ON OIL-FROTH ABSORBERS ISSUED

J. A. Campbell, natural gas engineer, has recently issued a folder describing the operation of his oil-froth absorber units in the extraction of natural gasoline from gas. The folder may be had by addressing P. O. Box 669, Long Beach, Calif.

GOVERNMENT ASKED TO REFUND FOR DRILLING COSTS

The Utah Oil Refining Company, which brought in a helium gas producing well near Price, Utah, is asking the Government to pay a sum reported at $130,000 to reimburse the company for expense of putting down the well. The well has been capped, subsequent to the Government's withdrawal of the land on which it is located from entry.

FINDS WELCOME ON RETURN FROM FROM WEDDING JOURNEY

When F. U. Naylor of the P. G. and E. gas sales department returned from his recent honeymoon he found an unusual recognition awaiting him at 245 Market Street, Company headquarters. On the fourth floor of the building thoughtful employees had fitted out an apartment bungalow for him, placarded with appropriate mottos of all kinds.

Our Gas Appliance Situation

(Continued from Page 14)

shortcomings in connection with the product itself to which many gas men shut their eyes, either from a lack of appreciation of such shortcomings or from an unwillingness to forego immediate profits. Why ignore the fact that business is slowly slipping away from us on account of such short-comings and that the electric men and oil men are benefitting from the failure of the gas industry to courageously visualize what the consumer thinks of our product and to take the necessary steps to correct the situation.

One of the most outstanding reflections upon our product is associated with the fact that in the combustion of gas, various offensive products are given off which contaminate the air, giving rise to a stuffy atmosphere. It is true the housewife may not know what it is or what caused it, but she knows that it is a relief to go into the outside air and when the electric man comes along he quickly takes advantage of the situation to displace our equipment. What is the answer of the gas man to this annoyance? "Well, it doesn't kill anybody!"—Yes! but is it good business to associate your product with discomforts? People frequently complain that the products of combustion of gas cause condensation to form on cold surfaces—that moisture runs down window panes, walls, etc. Again what does the gas man say? "Sure, it is lack of ventilation."

No! the future of the gas industry cannot be securely established with handicaps such as non-vented gas appliances, and the sooner the leaders of our industry take cognizance of this situation the sooner will we be in a position to meet the competition of other fuels and to secure the good-will and appreciation of our customers for our product.

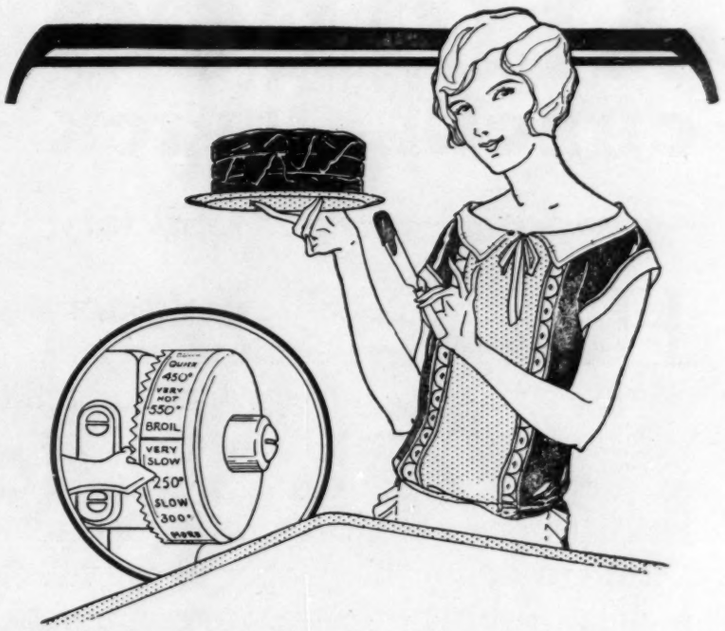
The writer doesn't demand the immediate and radical surgical operation of eliminating non-vented appliances, but rather setting up on the part of the leaders of our industry of a necessary ideal toward which we may work as fast as circumstances will permit. The venting of appliances should be encouraged not so much from the standpoint of hazard but in order that the use of gas may be permanently established without handicaps.

It goes without saying that in the supplying of the commodity itself, conditions of proper pressure, heating value and freedom from interruption must be maintained. I do not dwell on this matter since I think a conscientious and successful effort is being made by our gas utilities to maintain this character of service.

I think I have said enough to indicate the necessity for the gas company taking an active and deep interest in the problems of appliance utilization and the establishment of higher ideals of service in order to successfully compete with other fuels.

Gas Company Should Help Appliance Dealer

Let us now turn to the appliance dealer and study his situation as it affects the future of the gas industry. In the first place, the appliance dealer is up against a very competitive condition. He is not like the public utility with a monoply for his enterprise. He must adjust the prices so as to get the business or "go broke." He is therefore handicapped in a much more essential manner than is the public utility. It is therefore very frequently the case not so much that he is unwilling but is actually unable to conform with regard to the higher



Always perfect results with the *new* Gas Range

Gas Appliance exhibits are held each year to acquaint the people with all the newer features of gas ranges, automatic water heaters, and gas furnaces

When recipes for cakes, pies, and meats require an exact baking temperature, a special device on the new Gas Range keeps the oven at the proper heat. This device is called the Oven Heat Control.

Now you'll never need to peep into the oven—the Oven Heat Control watches *all* your bakings for you.

See the Oven Heat Control. It's found on all the new Gas Ranges exhibited by dealers during Gas Appliance Week—April 11th to 17th inclusive.

GAS APPLIANCE SOCIETY SERVICE CALIFORNIA

PACIFIC GAS AND ELECTRIC COMPANY

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206-426

One of the cooperative advertisements published in all newspapers in the Gas territory served by the Pacific Gas and Electric Company.

AMRECO
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HERE'S a specialized refractory ... developed in our own laboratories ... with high resistance to spalling and disintegration. ¶ The marked ability of Amreco Checker Brick to absorb heat and liberate it ... due to being the proper density ... is a feature which appeals to gas men. ¶ Amreco shows little shrinkage and is very durable under intense heat and severe service.

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ideals necessary to best promote the industry. This makes it imperative for the utility to carry a portion if not all of the expense of servicing appliances and educating the consumer in the usage of gas appliances. While most utilities are willing and able to cooperate with the dealers in their territories with regard to the actual gas service, they are not always so willing or able to cooperate with the dealer in the matter of selection of appliances and the servicing of the same. Some utilities go so far as to wash their hands of the matter. A study of the situation will show that the more the utility keeps out of the appliance business the worse are the relations between the dealer and the utility. Only one result can come from such a condition and that is poor gas service and a consuming public embittered not against the appliance dealer, but against the public utility. In support of this statement, I will cite a personal experience. I was in a hardware store recently in a southern city and out of curiosity I questioned the dealer concerning some of his gas appliances. To see what he would say I asked him, "Does this gas stove produce carbon monoxide?" The dealer said, "It isn't the gas stove that produces carbon monoxide, it is the kind of gas that the gas company sells here that does that." This is an extreme example of the impression that the public may get where there is not good cooperation between the utility and the dealer. I would like to report another instance which happened to me in another Pacific Coast city where I was staying with friends. In this particular city the utility is not in the appliance business. My hostess, knowing that I was a gas man, complained to me concerning a new gas stove which she had just purchased from a prominent department store, saying that she had been unable to get satisfactory service from this stove and related her experiences in connection with her efforts to remedy the situation. On paying her gas bill, she had solicited an inspection of this appliance in order to remedy the unsatisfactory peformance and had been informed by the company's representative at the counter that inasmuch as the shortcoming was in the gas appliance and not in the gas service, she should consult her dealer. Being thus rebuffed, she interviewed the salesman who sold her the appliance in the department store and made of him a similar request, and was told as follows: "We are absolutely helpless to remedy your trouble, as the trouble rests with the gas supply."

I made an examination of this appliance and found that the trouble was a natural gas orifice.

I mention these two instances from my own personal experience and I want to say that they are typical, not extreme examples of faulty public relations induced by lack of proper utilization policies.

In some cities, years and years go by under such conditions and it is small wonder that when the utility finally wakes up and makes an effort to get dealer cooperation it is looked upon with skepticism and suspicion. Some utilities are actually afraid to have anything to do with the appliance situation, so acute is the dealer antagonism, notwithstanding that the utility may not be in the appliance business. There is only one thing to do as far as the public utilities are concerned—that is to get into the appliance game with both feet, seeing that all of the consumers are given proper service, whether the appliances are installed by the utility or not; to set a higher standard by selling only the best appliances at a price permitting the dealer to make a legitimate

profit and thereby inducing dealer friends to do likewise and to assist in giving proper service on appliances sold by the utility.

Appliance dealers make a fundamental and serious mistake when they advocate that gas companies stay out of the appliance business. With the utility out of it, it is much harder to sell gas appliances and much more expensive to the dealer, since he assumes the entire cost of servicing appliances and in a good many cases has to correct faulty gas service.

Utilization Largely Engineering

The technical and engineering staff of most gas companies concern themselves but little with utilization problems. This is a big mistake. The men capable of advertising and merchandising appliances are not necessarily qualified to supervise the installations, to select appliances, much less to do the engineering and research to develop new uses for gas. The much talked of dealer-gas company cooperation must fall fiat so far as technical assistance is concerned. The way to get real dealer cooperation is to give them real help in their installations—not talk. The remedy—a department of utilitization to have charge of service and engineering. A dollar spent in this department will probably save two in gas sales promotion and three in public relations expense.

Activities of the Pacific Coast Gas Association

Originating a few years ago in a demand by the California State Master Plumbers' Association for legislation against certain gas appliances, an effort to improve the appliance situation was sponsored vigorourly by men within the industry such as L. F. Galbraith, H. R. Basford, past-president of the Association, and H. M. Crawford. This effort has culminated in four accomplishments by committees of the Pacific Coast Gas Association dealing with the various phases of the appliance situation:

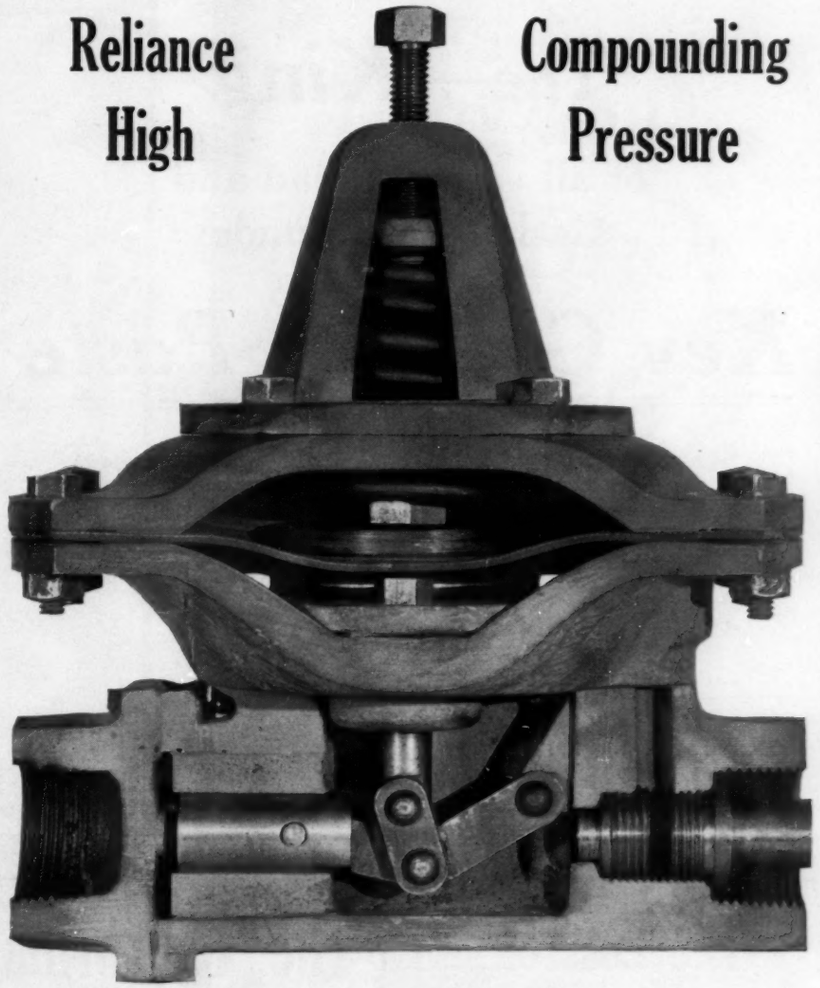
1st. The Gas Appliance Testing Code. This code consists of an assembly of laboratory testing methods for examining gas apuliances—a very necessary step in view of the previously uncertain character of laboratory procedure.

2nd. A manual just issued for those installing gas appliances, entitled "Gas Appliance Installation and Service Manual," this being a text book which should be in the hands of every dealer in gas appliances—in fact in every fitter's hands. Copies may be secured from the Secretary of the Pacific Coast Gas Association.

3rd. A committee to pass upon the safety and general desirability of gas appliances now being sold on the Pacific Coast. This committee has already issued several bulletins—one regarding approved gas tubing and several others condemning certain accessories for gas appliances. Information concerning these matters may be obtained from members of the Pacific Coast Gas Association. Other bulletins are in course of preparation and as soon as possible a list of reputable gas appliances will be issued to be amended from time to time according to the findings of the American Gas Association Appliance Testing Laboratory.

4th. In view of considerable agitation concerning the safety of gas installations by newspapers and the public and to foresatll any ill-considered or inimical legislation by municipalities, a committee of the Pacific Coast Gas Association has just submitted the final draft of a code for Municipal Regulations comprising a digest of the ordinances in various cities of the U. S. A. calculated to best protect the public against dangerous in-

Reliance High Compounding Pressure



The Reliance Compounding High Pressure Regulator has now been tested over a period of a year under all conditions and pressures varying from 5 to 400 pounds inlet. We are prepared to furnish them in ¾ in., 1 in. and 2in. sizes, and can guarantee that for close regulation, positive lockup, accessibility and **capacity,** they are in a class by themselves.

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Two Colors, Black Japan or Gray Enamel

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Sold Through Dealers Only

Manufactured by

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sallations and incompetent workmanship without unduly handicapping the gas industry..

An Appeal for Whole-Hearted Cooperation

The greatest obstacle in the way of remedying the situation confronting the gas industry today is the selfish attitude of individuals and corporations. If this attitude is not replaced by something more in keeping with the spirit of modern industry it will come about inevitably that the business will dwindle away to our competitors. Let us sink all our petty differences—utilities and dealers alike—and get behind a constructive program. Let us courageously do what is best for the industry in the long run, irrespective of immediate advantage. Let us place ourslves in the position of our consumers. Let us see the situation as they see it. Let us overcome the prejudice against gas by making installations that will be a credit to the industry.

Introducing *a* Year *of* Intensive Selling

(Continued from Page 21)

holding baking contests and carrying on a contest for advertising. To qualify it, in many of the Units the high school classes and the Campfire girls have been requested to elect from their membership a sufficient number of girls to supply one student for each store to act as advertising manager for that store during the Week, each to work under the direction of the store's advertising manager but to receive full credit for the advertising and be allowed to sign same.

The purpose of this activity was to create a reader-interest in advertising. The reader will recognize the fact that if a man or woman writes down a series of arguments to convince a friend or neighbor, he or she will be sold first and sold for all time. It was the knowledge of this fundamental that influenced the Advisory Board to recommend interesting the high school girls in writing the advertisements for its dealer members, for interesting the school means interesting the mothers of tomorrow and at the same time reaching into the homes and interesting the mothers of today.

This recommendation received the heartiest endorsement of any of the recommendations of the advisory board and it is safe to predict that the results will be more than satisfactory not only to the dealers, but to the schools as well, for it will awaken an interest in one activity which means much in maintaining prosperity—advertising.

Plans have been carefully laid for the Week just ahead, and a wave of favorable publicity for gas and good gas appliances should be the outcome. But the drive in itself is secondary to the thought that it is a feature Week for a year's intensive sales effort.

Hot Water does not rust COPPER or BRASS

Hot water is especially severe on corrodible metals.

But COPPER and BRASS are immune from its deteriorating effects because they do not rust.

Water heaters equipped with COPPER boilers and BRASS pipe deliver clean hot water and give lasting satisfactory service.

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Stockton Fire Brick Company

FIRE BRICK, INSULATING BRICK
HIGH TEMPERATURE CEMENT

High Grade Refractories

for

GENERATOR LININGS

CHECKERS

BOILER SETTINGS

OFFICE:
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SPRAGUE METERS

Represent Twenty-five Years
of Progress

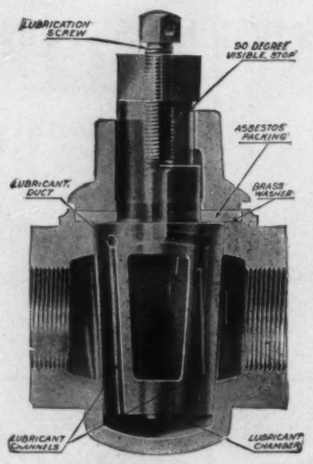
We are proud of our Service
in the West

Sprague Meter Company

Los Angeles, California - - San Francisco, California

THE MERCO NORDSTROM PLUG VALVE

Patented Lubricating Feature Prevents Sticking



This valve has all the advantages of the plug type with none of its weaknesses. *It cannot stick*—the patented lubrication and lifting features completely overcome this trouble and assure easy and positive operation.

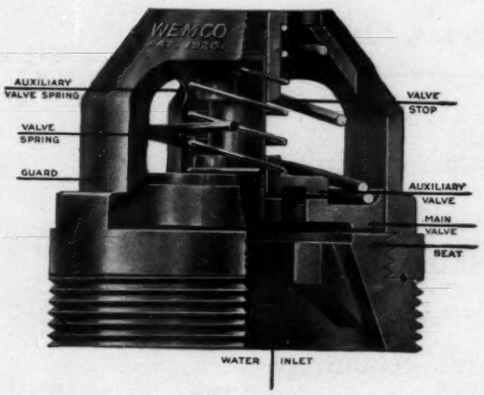
The cut on the left illustrates the design and shows how lubrication is accomplished. A Merco lubricant stick is dropped into the shank and the lubricating screw turned down upon it until the grease is forced through passages leading to ducts on either side of the plug. Reaching the base of the plug, the grease fills a sealed chamber and exerts an upward pressure on the bottom of the plug. This releases the plug instantly, should it be tight.

Let us explain the operation of these valves in more detail—you'll understand then why they're so efficient.

MERCO NORDSTROM VALVE COMPANY

121 Second Street **San Francisco, Cal.**

Your Pump is as good as Its Valves



The construction of the valve illustrated is such that the lift is greater than the valve area, insuring a free and unobstructed flow. All valves are made to guage and have the same lift. It has no studs, bolts or pins to become broken or lost.

HIGH pressure between suction and discharge valves means piston and valve slip, with a corresponding decrease in pump efficiency,—a direct loss in dollars and cents is the result. Wemco engineers have found instances in which 62% increase in valve area was required to allow for the maximum flow at the operating piston speed. Where Wemco Double Guided Pump Valves were installed, the desired increase was obtained. And invariably the valves paid for themselves within a short period.

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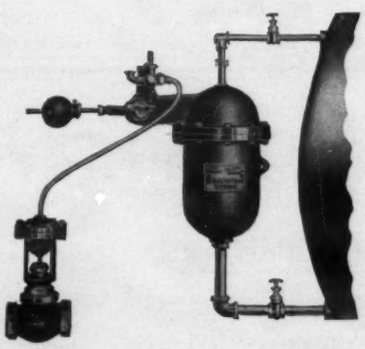
700 2ND STREET SAN FRANCISCO

Automatic Regulator for the Oil Supply in Absorber Tank



In the process of the manufacture of gasoline by absorbing the gasoline in oil and subsequently separating the gasoline from the oil by distillation, it is necessary to maintain a constant oil level in both the absorbing tank and the still.

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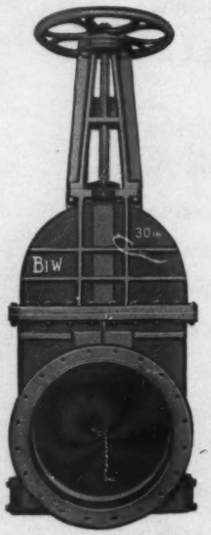

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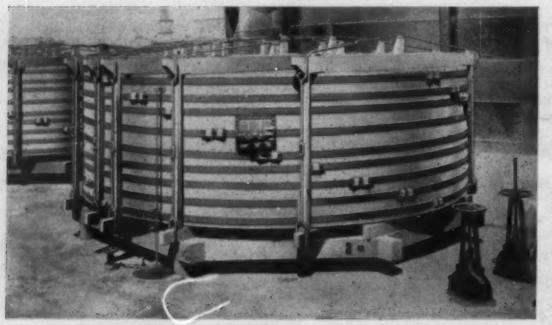

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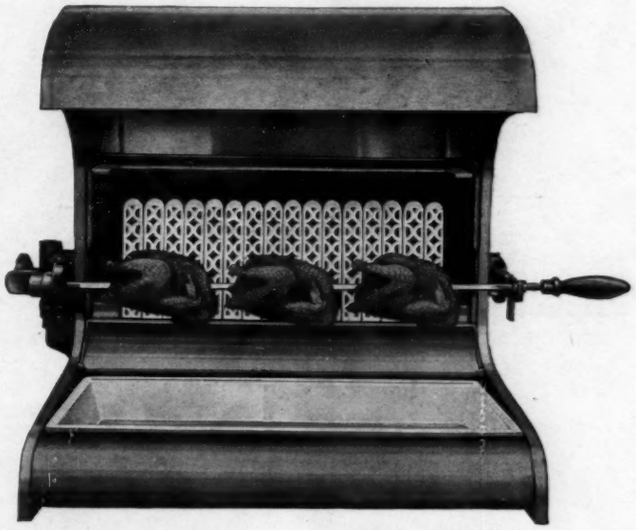

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